2410
PLANS

TIMBER MANAGEMENT PLAN

COEUR D'ALENE WORKING CIRCLE

COEUR D'ALENE NATIONAL FOREST

IDAHO

REGION ONE

F.Y. 1965 - F.Y. 1974

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Approved :	/s/ B. Payne /s/ DJM /s/ LRT	Acting Deputy Chief	1/13/64
Reviewed :	/s/ GFW /s/ HF /s/ REG /s/ WHJ	Timber Management	11/63
Reviewed :	/s/ Carl W. Wetterstrom	Multiple Use Coordination	11/63

Reviewed : 1100, 1600, 2100, 3000, and INT

INTRODUCTION

The Coeur d'Alene Working Circle was one of the first in the Northern Region to be developed extensively for its timber. Cutting began early in the century, became heavy quickly, and has continued so. Productivity of the land and proximity to manufacturing centers promise to play a major role in solving the more urgent forest management problems of the future and sustaining the economy of the area.

During the early decades industry sought only the prized, old growth white pine found in the area. Because of economic limitations, it was not possible to fully utilize associated species. This caused various degrees of partial cutting and the leaving of unwanted species and cull material on the ground. The opportunity to manage the working circle effectively has greatly improved since World War II. Increased saleability of species other than white pine has made even-aged management more feasible (Fig. 1).

This plan is based on 1956, 1958 and 1959 photography, and field data taken in 1961 and 1962. It was prepared by Forest personnel with technical assistance from the Regional Office. The sampling procedure on which the plan is based was developed by the Intermountain Forest and Range Experiment Station. Essentially, the system is a 10-point cluster of plots at each sampling location designed to yield both inventory and management information.

A total of 215 samples was taken, resulting in a sampling error of plus or minus 6 percent, two times out of three, for the total cubic volume estimate for the working circle. Sampling errors associated with area condition and management classes are, of course, higher. (See Appendix for details.)

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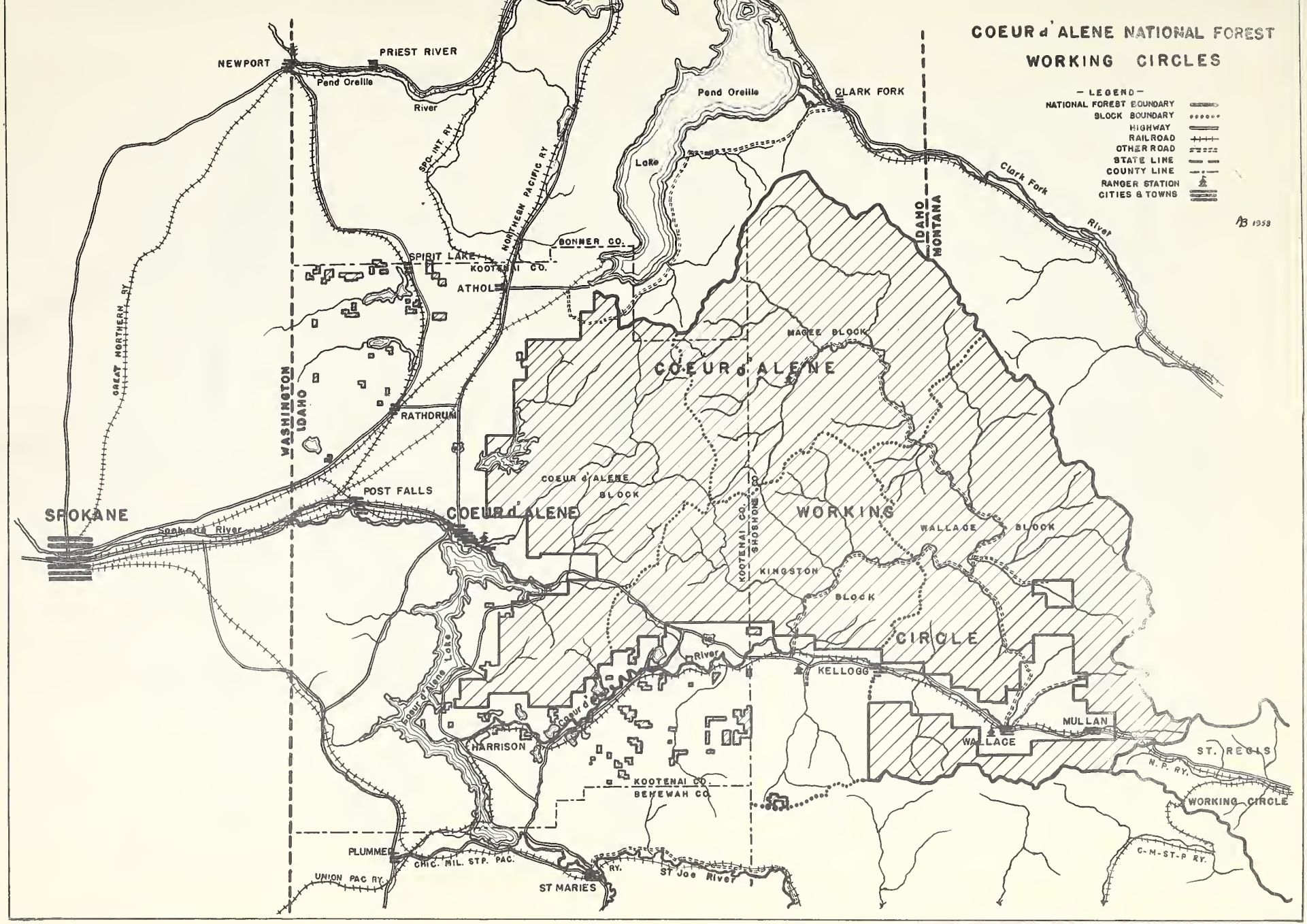
COEUR d' ALENE NATIONAL FOREST
WORKING CIRCLES
— LEGEND —
NATIONAL FOREST BOUNDARY
BLOCK BOUNDARY
HIGHWAY
RAILROAD
OTHER ROAD
STATE LINE
COUNTY LINE
RANGER STATION
CITIES & TOWNS
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NEWPORT
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Clark Fork River
SPO. INT. RY
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KOOTENAI CO.
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COEUR d' ALENE BLOCK
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KOOTENAI CO.
BENEWAH CO.
PLUMMER
CHIC. MIL. STP. PAC. RY.
UNION PAC RY.
ST MARIES
St Joe River
C-M-ST-P RY.

I. SUMMARY OF PLAN

A. AREA BY MAJOR LAND CLASSES AND OWNERSHIP

Owner	Non-forest	Non-commercial	Commercial Forest			TOTAL
			Stocked	Non-stocked	Total	
	M Acres					
National Forest:						
Nonreserved	6.4	16.6	654.0	40.4	694.4	717.4
Reserved	-	-	0.3	-	0.3	0.3
Total	6.4	16.6	654.3	40.4	694.7	717.7
Other	8.1	1.4	76.6	5.6	82.2	91.7
TOTAL	14.5	18.0	730.9	46.0	776.9	809.4

B. TOTAL VOLUME OF SAWTIMBER AND OTHER PRODUCTS
(Nonreserved Commercial National Forest Land)

Species							Total	Other Products
D	P	W	LP	S	L	Other		
MMBF (Scribner)								MMCF
1,480	180	1,253	222	59	449	1,525	5,168	228

C. GROWTH AND MORTALITY

Growth and Mortality	Per Acre	Total
	BF	MMBF
Periodic Annual Growth of All Growing Stock	113	70.4
Mean Annual Growth:		
Mature Sawtimber	92	13.2
Immature Sawtimber	141	38.7
Mature and Immature Sawtimber	124	51.9
Annual Sawtimber Mortality	61	25.5

D. ANNUAL CUTTING LIMITATIONS AND OBJECTIVES[1/]

Type of Cut	Cutting Area[2/]	Sawtimber			Other Products
		Live	Dead	Total	
	Acres	MMBF (Scribner)			MMCF
Harvest					
Regeneration	5,000	93.0	1.0	94.0	1.1
Overwood Removal	1,200	7.0	-	7.0	-
Intermediate	1,000	2.0	-	2.0	0.1
TOTAL	7,200	102.0	1.0	103.0	1.2

1/ The total allowable annual cut is the yield from 7,200 acres, estimated to be 102 MMBF of live and 1 MMBF of dead sawtimber. Other products are unregulated.

2/ Regulation of harvest cuts will be by area but coordinated with volume control. Budgeting of intermediate cuts will be by area only.

E. SUMMARY OF ANNUAL MANAGEMENT NEEDS

Treatment	Mature Stands			Immature Stands			Non-Stocked Areas	TOTAL	%
	High Risk	Low Risk	Decadent	Sawtimber	S&S	Other			
	Acres								
Regeneration Cuts	5,000	-	-	-	-	-	-	5,000	30
Overwood Removal	-	-	-	-	-	1,200	-	1,200	7
Risk Cuts	-	1,000	-	-	-	-	-	1,000	6
Rehabilitation	-	-	1,000	-	-	-	-	1,000	6
Commercial Thinning	-	-	-	1,000	-	-	-	1,000	6
Precommercial Thinning	-	-	-	-	1,550	-	-	1,550	9
Planting	2,450	-	1,000	-	-	-	2,500	5,950	36

F. EFFECTIVE PERIOD OF PLAN

July 1, 1964 to June 30, 1974.

II. SUMMARY OF RESULTS UNDER PREVIOUS PLANS AND COMPARISONS WITH PRESENT PLAN

A. Four previous plans have been prepared for the working circle. These were approved in 1912, 1923, 1936, and 1958. Field sampling for the last plan actually occurred in 1956. These plans provided annual harvest of live sawtimber as follows:

	WP	Other	Total
		MMBF	
1912	-	-	53-70
1923	50	Not regulated	-
1936	15	Not regulated	-
1946 (Interim)	20	55	75
1958	32	68	100
This plan	32	68	100

The actual cut of sawtimber during the period 1958-1962 was as follows: (Also see Fig. 1.)

	Calendar Year					Total	Percent of AAC
	62	61	60	59	58		
	MMBF						
White Pine	37.1	37.6	29.5	30.3	21.2	155.7	97
All Species	122.3	113.6	95.9	91.0	86.9	509.7	102

This indicates that cutting of white pine and all species during the period was within limitations provided by the former plan.

B. Comparison of nonreserved National Forest areas is as follows:

	1958	This plan
	M Acres	
Commercial Forest	689	694
Noncommercial Forest	18	17
Nonforest	12	6
Total	719	717

Minor differences in area are due essentially to changes in definitions.

C. The following table compares percent of area by forest types:

Type	1936	1958	1963
	-----	Percent	-----
White Pine	59[1/]	24	17
Ponderosa Pine	5	5	5
Larch--Douglas-fir	31	49	55
Other	5	22	23

1/ Based on 20 percent representation of white pine in type as compared to plurality in 1958 and 1963.

The significance of this comparison is the apparent depletion of the white pine type and its conversion to larch--Douglas-fir. This, in part, is due to changing definitions, cutting only white pine during prewar years when the market for mixed species was poor or nonexistent, and white pine mortality from blister rust and pole blight. This apparent type conversion is further illustrated by an analysis of sample plots which fell on past cutover areas. The results are as follows:

PRESENT TYPES ON STOCKED CUTOVER AREAS

	Percent
Grand Fir-Hemlock-Subalpine Fir	44
Larch--Douglas-fir	35
White Pine	7
Lodgepole Pine	6
Other	8

Although there is no way of knowing what the types were at the time of cutting, it is believed to be proportionate to the volume removed, or about 30 percent white pine. This confirms the belief that there has been a substantial reduction in the white pine type.

D. The following compares stand size for 1958 with that shown in this plan:

Stand Size	1958	This Plan
	---	M Acres ---
Sawtimber[1/]	344	420
Poletimber	205	203
Seedling & Sapling	94	31
Nonstocked	45	40
Total	688	694

1/ Based on 11" minimum d.b.h. for sawtimber in 1958 as compared to 9" minimum d.b.h. in this plan.

TREND IN CUT OF WHITE PINE AND OTHER SPECIES

Coeur d'Alene W. C.

1963

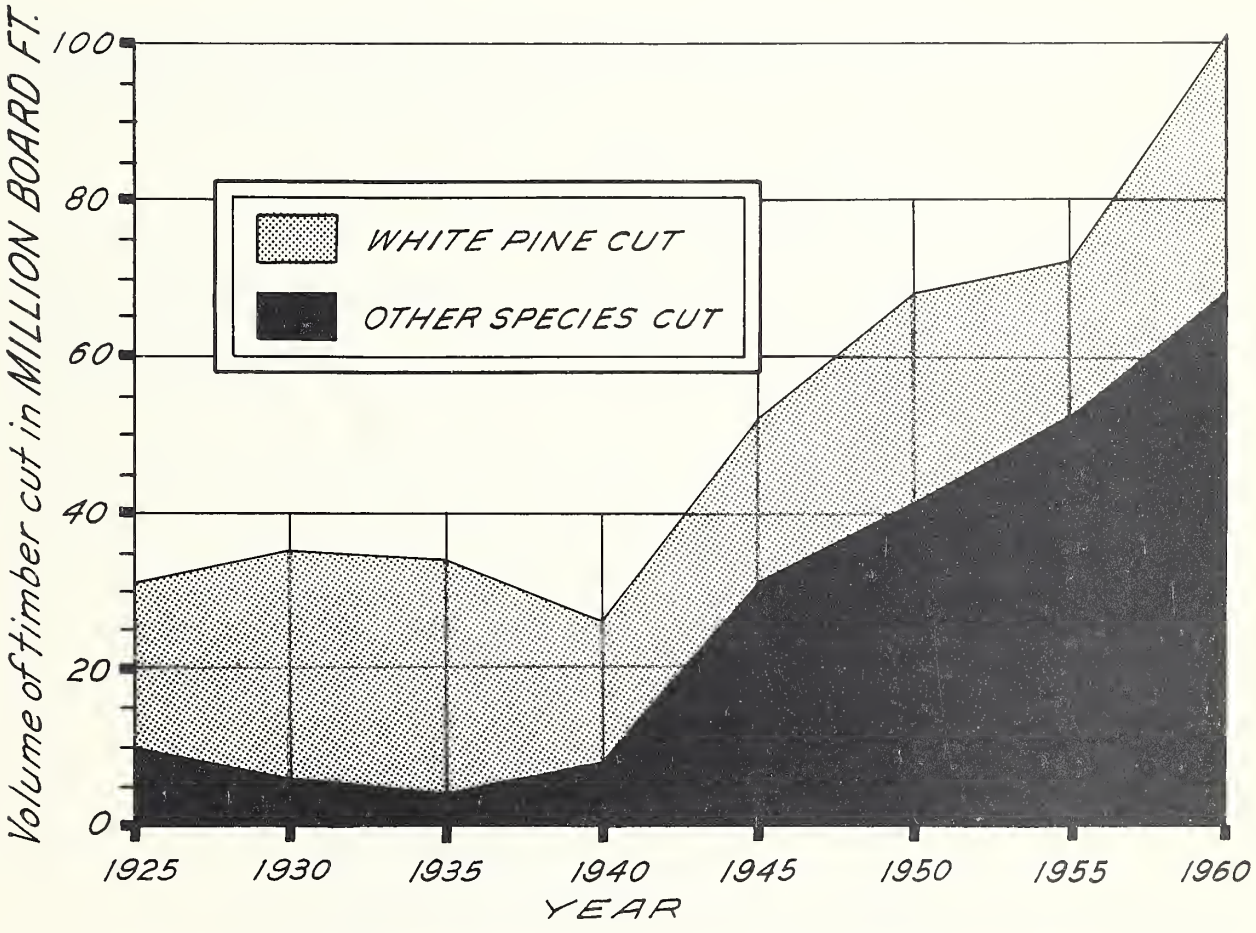

fig. 1

E. Net volume (Scribner) compares as follows:

	1958	This Plan	Percent of 1958
	MMBF		
White Pine	1,618	1,253	77
Ponderosa Pine	251	180	72
Larch--Douglas-fir	1,717	1,929	112
Other	2,363	1,807	76
Total	5,949	5,169	87

This comparison is not too significant, since the sampling error for the strata is quite high. However, based upon the inventory data, it is evident that there has been a substantial reduction in white pine volume.

The reduction in Other volume (primarily grand fir and hemlock) is attributed to difficulties in determining cull and defect. This belief is supported by the following analysis:

	1958	This Plan	Percent of 1958
	MMCF		
Cull Volume	166	395	238
Gross Volume Growing Stock	1,625	1,515	93
Net Volume Growing Stock	1,549	1,379	89
Cull and Gross Volume Growing Stock	1,791	1,910	107

F. Management accomplishments from 1958 through 1962 are as follows:

	Acres
Area Denuded	
Fire	1,366
Harvest Cutting	11,212
Total	12,578
Area Regenerated	
Planting	2,360
Direct Seeding	100
Natural Regeneration	5,000
Total	7,460
Area Thinned	
Regeneration Release	308
Precommercial Thinning	1,196
Total	1,504

	Acres
Area Pruned	
Pruning	500
Site Preparation	
Dozer Bunch and Burn	1,786
Prescribe Burn	2,558
Total	4,344
Protection	
Blister Rust Aerial Spray	63,000

III. DESCRIPTION OF WORKING CIRCLE

A. AREA AND LOCATION

The Coeur d'Alene Working Circle contains about 809,000 acres of land which is largely in the Coeur d'Alene River drainage east of Coeur d'Alene Lake, but it also includes certain parcels of National Forest lands and other areas north of the lake adjacent to Rathdrum Prairie. The area is entirely within Idaho, and includes the northern portion of Shoshone County, the eastern postion of Kootenai County, and the extreme south-eastern portion of Bonner County.

B. PHYSIOGRAPHY AND GEOGRAPHY

Generally speaking, it is steep, rough country. It lies on the west slope of the Bitterroot Mountain range and except for the western portion which slopes into the Purcell Trench, it has escaped glaciation, except for a few small glaciated areas at high elevations such as in the vicinity of Lookout Pass.

The Coeur d'Alene River has cut a peculiar pattern through the area resembling a big oxbow. The headwaters of the river flow east and south for nearly half of its length, then it swings west, joining the South Fork and enters the south end of Coeur d'Alene Lake. There is little or no inaccessible area in the unit.

C. OWNERSHIP

Management of the Coeur d'Alene Working Circle is largely a public responsibility. About 91 percent of all the land is in some form of public ownership. All but 11 percent of the area in the working circle is the responsibility of the Forest Service (Table 1).

TABLE 1 - AREA BY OWNERSHIP

Ownership Class	M Acres	Percent of Total
National Forest	717.7	89
State	18.5	2
Private	73.2	9
Total	809.4	100

D. ADMINISTRATION

Administration of National Forest lands in the Coeur d'Alene Working Circle is accomplished through four District Rangers responsible to the Forest Supervisor.

Each Ranger District is treated as a management block (Table 2). The blocks have been further divided into compartments, boundaries of which follow topographic features. Compartments range in size from 318 acres to 11,155 acres. The average compartment contains 5,741 acres. Administrative responsibilities within the working circle are summarized in Table 2.

TABLE 2 - WORKING CIRCLE SUBDIVISION OF NATIONAL FOREST LANDS

Block		Compartment	Number of	Gross Area	
Name	Number	Numbers 1/	Compartments	Acres	Percent
Wallace	1	111-199	39	231,209	32
Kingston	2	200-280	27	114,893	16
Fernan	3	301-374	28	165,289	23
Magee	4	415-464	31	206,342	29
Total			125	717,733	100

1/ Numbering not consecutive.

A 3.6 thousand-acre portion of the Fernan Ranger District is set aside as the Deception Creek Experimental Forest. This area is administered by the Intermountain Forest and Range Experiment Station with cooperation from the Coeur d'Alene Forest Supervisor.

E. TIMBER RESOURCES

Basically, this is a timber producing area. The timber resource supports a greater portion of the population than any other resource, or of all others combined.

All but a very small part of this working circle is classed as commercial forest land. Likewise, only a small portion of the commercial forest land is reserved from timber use (Table 3).

TABLE 3 - AREA OF NATIONAL FOREST LAND BY MAJOR CLASSES

Land Class	M Acres	Percent
Nonreserved Forest Land		
Commercial	694.4	97
Noncommercial	16.6	2
Reserved Forest Land		
Commercial	0.3	- 1/
Nonforest Land	6.4	1
TOTAL	717.7 2/	100

1/ Less than 0.5 percent.
2/ Shown as 723.4 M acres in National Forest Areas - 1962.

The total nonreserved commercial forest acreage in the working circle is 694,356 acres. Of this total, 96 percent (653,972 acres) is stocked and 40,384 acres are nonstocked.

The nonreserved commercial forest land is 21 percent mature sawtimber, 40 percent immature sawtimber, 29 percent poletimber, 4 percent seedling and sapling, and 6 percent nonstocked. This distribution of maturity classes appears to be quite satisfactory. However, a great shortage of area in the 1-20, 81-100 and 101-120 age classes exists (Fig. 2).

By types, 41 percent of the total area of nonreserved commercial forest land is classified as Douglas-fir, 17 percent as western white pine, 14 percent as western larch, and 8 percent as western hemlock. The remaining 20 percent is distributed among lodgepole pine, grand fir, ponderosa pine, subalpine fir, Engelmann spruce, mountain hemlock, and western redcedar (Fig. 3). Classifications are based upon the predominate species in the present tree cover. As stated elsewhere, this shows a strong decline in the western white pine type based on previous inventories, and a sharp rise in other less valuable types.

The total net sawtimber volume on the working circle is 5,167.7 MMBF of sawtimber. Of this total, 29 percent is Douglas-fir, 26 percent is western white pine, 10 percent is western larch, and 4 percent is ponderosa pine. All other species comprise 31 percent, the bulk of which is grand fir and hemlock.

An average of 13 percent of all sawtimber volume is log grade 1, 17 percent log grade 2, 49 percent log grade 3, and 21 percent log grade 4 (Appendix Table 14).

F. USE RELATIONSHIP

Timber production is the principal use of the working circle. However, the area is also an important watershed, and it offers numerous recreational opportunities. A small area (347 acres) of nonreserved forest land has been set aside for recreational uses. In addition, another 13,300 acres of low site brush fields have been excluded from management considerations in this plan (Table 4).

TABLE 4 - AREA OF EXCLUSIONS

	Acres
Campgrounds and Picnic Areas	306
Historical Areas	28
Winter Sports Area	13
Low Site Brush Fields (deferred)	13,300
TOTAL	13,647 1/

1/ Exclusive of 1,782 acres of administrative sites and powerline withdrawals which were classed as nonforest.

There are other areas which will receive modified silvicultural treatment to better meet multiple use needs. Treatments will be modified on some 67,810 acres of commercial forest lands in order to protect critical watershed areas, or to accomodate other uses in accordance with Multiple Use Management Guide for Northern Region (FSH 2121.4 R1).

A summary of Forest lands where management may be modified is shown in Table 5.

TABLE 5 - AREAS ON WHICH MANAGEMENT MAY BE MODIFIED

	Acres
Travel Influence Zone:	
Roadside	12,455
Setback Strips	569
Trailside and Streamside	1,485
Total	14,509
Water Influence Zone	6,703
Municipal Watersheds	45,853
Scenic Areas	745
TOTAL	67,810

AREA OF COMMERCIAL FOREST
(BY STAND SIZE AND TYPE)

Coeur d'Alene W. C.

1963

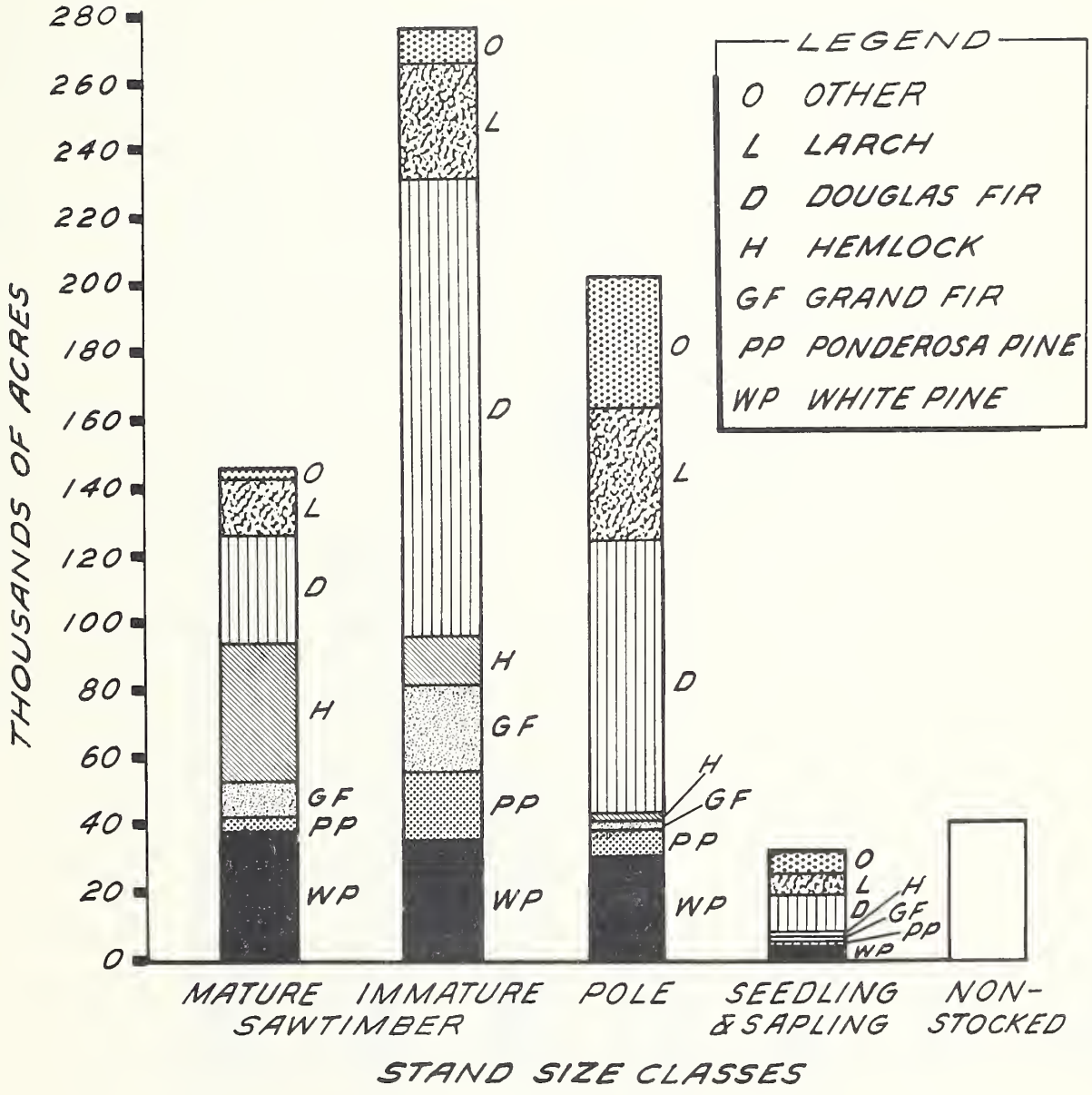

fig. 2

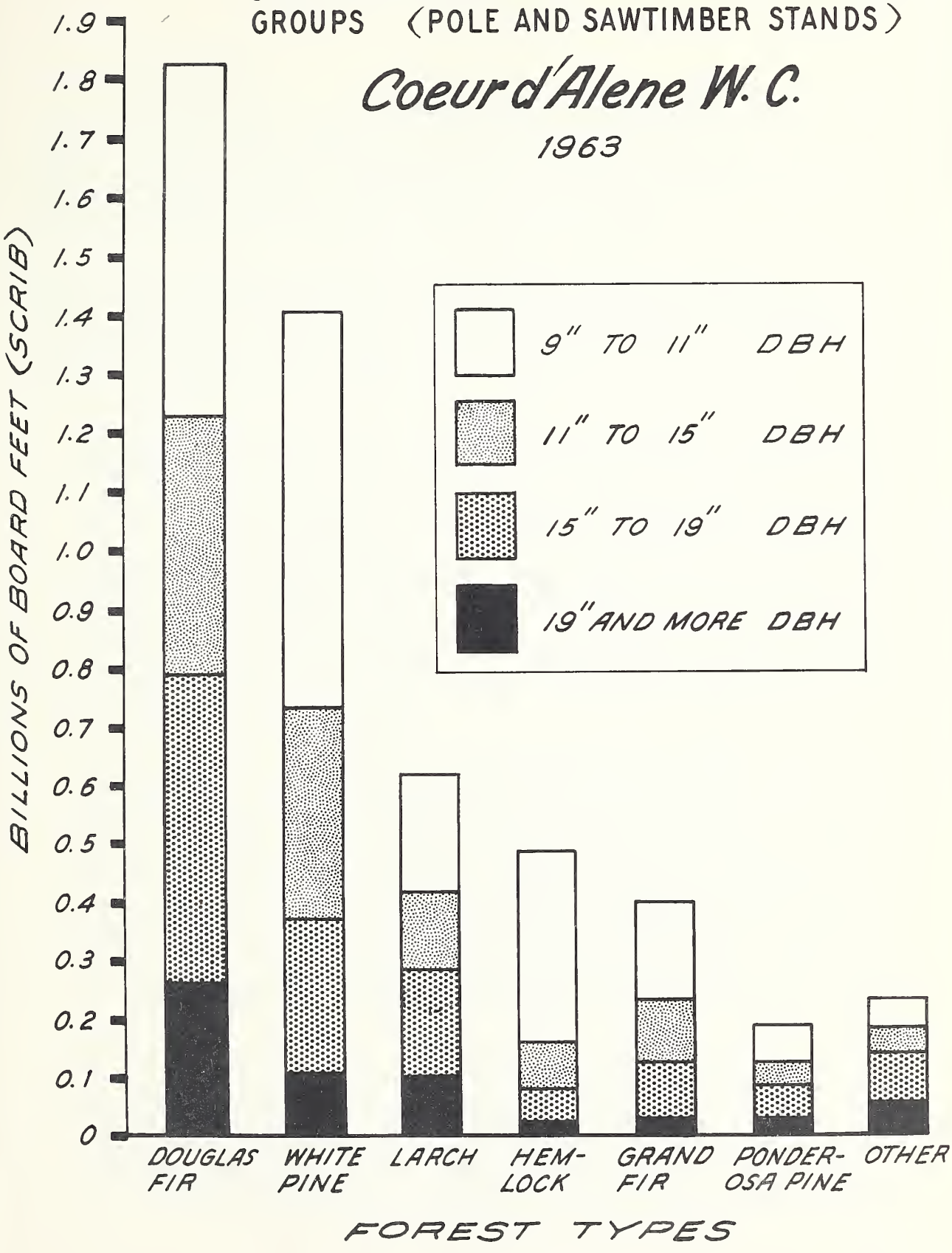
SAWTIMBER VOLUME BY TYPES AND DIAMETER GROUPS (POLE AND SAWTIMBER STANDS)
Coeur d'Alene W. C.
1963
BILLIONS OF BOARD FEET (SCRIB)
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
9" TO 11" DBH
11" TO 15" DBH
15" TO 19" DBH
19" AND MORE DBH
DOUGLAS FIR
WHITE PINE
LARCH
HEM-LOCK
GRAND FIR
PONDER-OSA PINE
OTHER
FOREST TYPES

fig. 3

G. SOILS AND SITES

Soils of this working circle are unsurveyed. Some general information is available for adjacent private lands, mostly along the east side of Coeur d'Alene and Hayden Lakes (Soil Survey Kootenai County, USDA 1919). The soil map shows small mixed areas of deep and shallow silty soils, associated with basalt outcrop, on the basalt plateau.

Sandy soils which are developed from glacial till and silty or clayey soils which are derived from glacial lake deposits occur north of Hayden Lake. Only a small part of this area is National Forest land. The steep mountainous lands within the National Forest have soils which are similar to those in the adjacent St. Regis area. A proposed soil key, as now being prepared, is generally as follows:

Group I - Soils developed over relatively soft, thinly bedded, often calcareous argillite, with surface influence of loessal material including volcanic ash. These soils vary in depth from shallow to deep (20 inches to more than 8 feet). Coarse rock fragments increase with depth. Differences in soil series would be associated with elevation, temperature, and precipitation which in turn influence the ecology of the Forest. The most productive soils are expected to occur in Group I, with some variations on north-south exposures. The ecological classification for this group is principally western redcedar, hemlock, and western white pine. Some road surfacing problems may occur due to the relatively soft nature of underlying bedrock and moderate to high silt and clay content of the soils. Soils of Group I are limited to a small portion of the working circle.

Group II - Soils developed over relatively hard quartzite, argillite, and sandstone, usually noncalcareous, with surface influence of loessal material including volcanic ash. Depth of these soils is quite variable, containing larger areas of shallow soils than Group I. The group contains a larger amount of coarse fragments which increases with depth but display a marked variation in north-south exposure; and also revealing the usual soil series differences associated with elevation, temperature, and precipitation. This in turn influences the ecology of the Forest. Few road problems are expected to occur. Productivity will be medium, with marked variation and some low productivity associated with exposure. Western redcedar may be absent on most of these areas.

Group III - These are the soils of bottomlands and terraces. Soil series will vary with degree of drainage, differences in texture, and amount of loessal or volcanic ash material associated with the surface soils. The soils series will show the usual differences associated with elevation, temperature, and precipitation which in turn influence the ecology of the Forest. Productivity is expected to be relatively

high. Road problems will vary with degree of drainage and with the texture encountered. Soils of Group III, along with minor areas on basalt plateau and glacial drift materials of the Purcell Trench, occupy only a small portion of the working circle.

Group IV - Soils of this group are expected to occur at highest elevations and may be developed over any of the rock material listed in soil Groups I and II above. Their chief characteristic is relatively thick, dark colored surface layers associated with south exposures and grassland or savannah-like grass, lodgepole pine, Engelmann spruce, Douglas-fir, and whitebark pine. This represents the subalpine forest-grass transition. However, some areas may have relatively dark thin surface soils with relatively thick cover of lodgepole pine or spruce-subalpine fir. This group displays major rock outcrops, glacial cirque basins, and minor glacial drift deposits at these high elevations.

Group V - These are soils along the Coeur d'Alene River which have been effected by past smelter fumes. They occupy only a small part of the working circle.

Fifty-two percent of the commercial forest area is good site, 40 percent medium site, and 8 percent poor site according to the 1962 sample (Appendix Table 13). Because measurement of site in this sample was based on a single tree for each location, it is not believed to be as reliable as that determined from previous inventories. Site areas and percentages from the earlier inventory are therefore shown in Table 6 and used for management considerations.

TABLE 6 - COMMERCIAL FOREST AREA BY SITE CLASSES[1/]

Site Class	M Acres	Percent
Good	104.1	15
Medium	499.6	74
Poor	77.0	11
Total	680.7	100

1/ Excludes areas listed in Table 4.

There is only a small amount of poor site land. From the standpoint of site quality, only 11 percent is in the poor category. The rest is classed as medium or good site.

H. CLIMATIC AND ECOLOGICAL CHARACTERISTICS

While most soils on the working circle tend to be shallow, the area lies within a moisture belt favorable to tree growth. Rainfall ranges from 25 inches in the lower elevations (2,000 feet above sea level) on the western fringes of the working circle to 70 inches in the higher elevations (6,000 feet and over). On most of the area, precipitation is in excess of 40 inches. Also, it is quite uniformly distributed throughout the year. July and August are normally the dry months. At the lower elevations most of the moisture comes in the form of rain, but at the higher elevations most of it is in the form of snow.

As would be expected, timber types vary over this wide elevational and moisture range. The working circle spreads over four ecological zones; i.e., ponderosa pine, Douglas-fir, cedar-hemlock, and spruce-fir. Ponderosa pine occurs on the drier sites at the lower elevations, giving way to Douglas-fir, grand fir, and white pine in about that order as moisture increases. White pine in turn gives way to lodgepole pine, Engelmann spruce, and subalpine fir in the spruce-fir zone at the higher elevations.

Over 90 percent of the working circle falls in the Douglas-fir and cedar-hemlock zone. A peculiarity of this area, however, is that cedar occurs less frequently here than elsewhere in the cedar-hemlock zone. Throughout most of this ecological zone, western redcedar is a common associate of white pine, and in stream bottoms it may be the most numerous stand component. In this working circle, however, white pine stands have almost a pure understory of hemlock with little or no cedar. Also, cedar occurs only rarely as a type. At one time there were fair stands of western redcedar along the main river and larger tributaries. Now, as a type, it occurs on less than a thousand acres.

I. ECONOMIC CHARACTERISTICS OF THE AREA

The working circle lies about in the center of the Inland Empire, an area that has had a rich timber industry history. To date the principal timber industry has been sawmilling. There is about 500 million board feet of annual sawmill capacity installed within a 50-mile radius of the working circle. Over 70 percent of this capacity is in large permanent mills with facilities to fully process lumber.

Another industry in this area is the processing of poles and piling. Compared to sawmilling, it is small. Pole yards in the Inland Empire buy about 250,000 poles a year. At one time this market was limited to western redcedar. However, in the last two decades, larch, Douglas-fir, and lodgepole pine poles have been taken in increasing quantities.

In recent years there has been an expansion of the pulp and paper industry in the Inland Empire and surrounding areas that has also had some effect on utilization. One paper plant at Lewiston, Idaho, and two pulp plants

located at Missoula, Montana and Wallula, Washington have been added to the Region within the past 10 years and are now obtaining chips from sawmills in the Coeur d'Alene area. This has improved timber utilization at the mills, but has not helped utilization in the woods. Only one of the four mills uses roundwood extensively as raw material and thus far it has not had much effect on utilization of raw material from this working circle.

From the standpoint of raw materials and related resources, there are ample opportunities to expand the industry, particularly into products other than sawtimber. The larger plants could benefit in many instances by further diversification. Also, there is need for a number of small plants to handle small products and remanufacturing if relatively high logging and transportation costs could be solved.

IV. MANAGEMENT SITUATION

A. BACKGROUND AND OVERALL SITUATION

Early development of the Inland Empire area through construction of the Mullan Road, transcontinental railroads, accessible waterways, and mining helped to focus timber activity on the Coeur d'Alene Working Circle.

The advantages of early accessibility should not obscure the fact that the Coeur d'Alene Working Circle also contained high quality white pine stands. Contributing to the prevailing high quality of timber on the Coeur d'Alene was the relatively large acreage of medium site. This resulted in moderate growth and wood of rather uniform texture. A dense hemlock understory also checked the growth rate and contributed to early natural pruning.

Thirty years ago over half the area supported stands of timber in which 20 percent or more of the volume was white pine. The early information is significant in that it suggests the area that can grow white pine.

Conditions of accessibility and prevalence of high quality white pine, the chief elements which attracted industry years ago, also created certain management problems.

Cutting of the white pine from mixed stands left high volume stands having low value residual timber that is now submarginal from a merchantability standpoint. These stands occupy our very best sites and are in need of rehabilitation. This plan shows a need to rehabilitate 1,000 acres a year for the next 20 years.

This same type of cutting, when heavier, encouraged establishment of a dense cover of high brush (mountain maple, mountain ash, etc.), and generally did not result in establishment of reproduction. In harvesting these stands today, the manager encounters an extreme brush problem, making it more difficult to prepare the sites for regeneration without the benefit of adequate residual values. These are real impediments in trying to adhere to plan objectives specifying clearcuts and even-aged management.

For the past five years, the level of cut on the Coeur d'Alene Working Circle has exceeded the growth of immature sawtimber stands on a per acre basis. This, in part, is due to a great shortage of acreage in the 81-100 and 101-120 age classes which contribute very little to overall sawtimber growth (Fig. 4). Large acreages of 41-60 and 61-80 age classes are in dire need of thinning to increase growth.

In the past few years steps have been taken to reduce the cut in single-story stands and cut more in two-storied stands. The year 1962 is shown as an example in Table 7. This has tended to increase the growth in the immature sawtimber category.

TABLE 7 - F.Y. 1962 SAWTIMBER CUT BY TYPE OF CUT

Type of Cut	Million Board Feet	Percent of Total
Harvest	59.0	54
Overwood Removal	37.8	34
Salvage	13.6	12
Total	110.4	100

It is also significant that in concentrating on single-story, high volume stands, and on volume production (the 1958 plan regulated the cut of volume only) less area was being cut over year after year than would be required under area regulation. Age classes were getting further and further out of balance. A correction of this condition is provided for under section V, Regulation, and the management prescriptions which follow.

B. POTENTIAL OF THE WORKING CIRCLE

An estimate of the potential of the working circle, based on research experience, indicates that we can expect to grow crops of sawtimber ranging from 26 M to 58 M board feet per acre at optimum rotations (Table 8).

AREA BY AGE GROUPS

Coeur d'Alene W. C.

1963

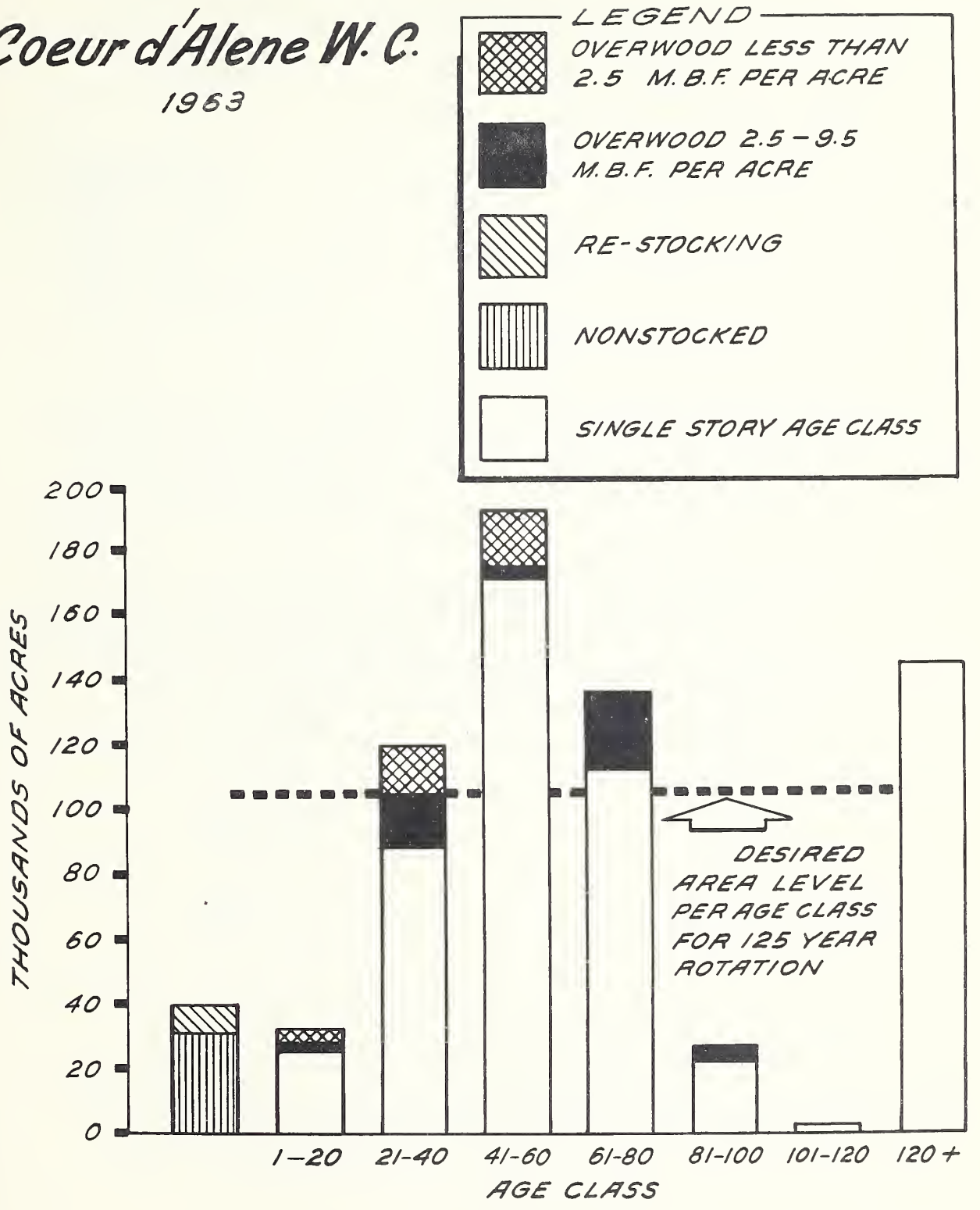

fig.4

TABLE 8 - POTENTIAL HARVEST YIELDS OF SAWTIMBER UNDER MANAGEMENT[1/]

Species	Rotation	Volume per Acre	Mean Annual Increment
		MBF	
White Pine	120	58	483
Ponderosa Pine	120	26	186
Lodgepole Pine	100	27	270
Larch	130	37	264
Douglas-fir	130	36	257
Hemlock-Grand Fir-Cedar[2/]	120	35	292
Spruce-Subalpine Fir	120	54	450
All Types	125	49	392

1/ Yields possible if stocking is controlled and the stands are managed to achieve 75 percent utilization of the growing space by crop trees at harvest time. Based on studies made by the Intermountain Forest and Range Experiment Station.

2/ Sites are equivalent to white pine when converted to that species.

The following are estimates of sawtimber yields under this intensity of management which exceeds yields from normal unmanaged stands:

TABLE 9 - POTENTIAL ANNUAL SAWTIMBER YIELDS BY SOURCE OF CUT

Source	Annual Yield
	MMBF
Harvest cut	254
Intermediate cut	51
Total	305

This level of yield is predicated on:

1. Achieving prompt regeneration on all areas cut and burned.

2. Control of the growing stock throughout the life of each stand and managed to achieve 75 percent utilization of the growing space by crop trees at rotation age.

White pine production has been harrassed by manifold insect and disease problems in recent years which has lowered volumes and representation in many stands and sites. It has been worse on south slopes and certain other areas of low water-holding capacity than elsewhere. As a rule, therefore, we should avoid reestablishment of white pine on such sites, but rather concentrate our efforts on bottom lands, north, east, and northwest slopes where sites are better, enemies of white pine fewer, and where trees are generally more vigorous and longer-lived. This means rehabilitating and converting most of the cedar-hemlock-grand fir types and perhaps a few others to white pine, but not including those now growing Douglas-fir. Under management all of these areas should produce in excess of 50 MBF per acre if converted to white pine.

Whether or not we attempt to grow this proportion of white pine will depend upon the effectiveness of recently developed antibiotics, and the development of blister rust resistant white pine stock.

C. MANAGEMENT ANALYSIS

Stand conditions in the working circle were analyzed on an area basis to determine the type and extent of treatment that will be needed to bring the growing stock into more satisfactory condition.

Sampling errors are associated with these area statistics because all of them are derived from samples. As a rule, such sampling errors are high, particularly where the areas involved are small. The reliability of the area estimates improveswhen the strata contain more area. The following is an indication of the reliability of area estimates depending on the relative amount of area in a particular stratification:

Percent of the Total Area Involved in the Strata	Reliability in Percent 1/
10	43
20	27
30	21
40	17
50	14
60	13

1/ 95 percent of the time.

The summary of growing stock and site conditions presented in Table 10, indicates a good array of sites to work with, but a rather poor distribution of size classes.

TABLE 10 - AREA OF LAND AVAILABLE FOR TIMBER PRODUCTION BY BROAD STAND CATEGORIES AND SITE CLASSES

Stand Category	Sites			Percent
	Good and Medium	Poor	Total	
	- - - - - M Acres - - - - -			
Mature Sawtimber	128.7	15.9	144.6	21
Immature Stands				
Sawtimber	242.0	33.0	275.0	40
Poletimber	178.4	24.3	202.7	30
Seedling & Sapling	27.5	3.8	31.3	5
Total	447.9	61.1	509.0	75
Nonstocked	27.1	-	27.1	4
TOTAL	603.7	77.0	680.7	100

This table indicates that 89 percent of all commercial forest land is in the good and medium site category. Only 11 percent of the commercial forest land is on poor site.

1. Single-Story Mature Timber Stands

In general, all single-story stands on the Coeur d'Alene Working Circle that are rotation age or older, except for the special working group, will be harvested by even-aged management methods and in accordance with Regional Management Guides. However, the following three main categories of land occupied by mature single-story stands must be carefully evaluated. These are:

a. Land in a Blister Rust Control Unit. Past experience indicates that these areas must be clear cut, followed with hot control burn, and then planted.

b. Land Not in a Blister Rust Control Unit and Not on Severe South Slopes. Here clear cutting and planting, or using the seed tree method, seems to be the appropriate silvicultural system.

c. Land on Severe South Slope. Here the shelterwood method, relying on natural reproduction, seems to produce the best results.

Three stand conditions exist within the above categories:

a. Low Risk. Generally, stands that are about mature, but not critically overmature, and will remain in thrifty condition for the next 20 years. Generally, salvage and sanitation cuts are prescribed for these stands.

b. High Risk. Stands that are generally overmature and in poor condition. These are the stands that will deteriorate over the next 20 years and should appear on the 5-Year Timber Harvest and Access Road Plan. These stands should be clear cut, except on severe south slopes, and regenerated according to prescribed regional guides.

c. Decadent Stands. These are stands that are no longer merchantable from a saw log standpoint, or at best, only rarely. They have become so mainly through removal of all former values by partial cuttings. (Parts of Big Elk Creek are examples.) The areas are unproductive in their present condition. Rehabilitation will be prescribed for these stands.

Rotation age and older stands occupy 144.6 M acres, or 21 percent of the land available for timber production. Over 60 percent of these stands has been classified as high risk or decadent (Table 11).

TABLE 11 - AREAS OF MATURE TIMBER BY RISK CLASS AND SITE

Risk Class	Area by Site Classes			Percent of Total
	Good & Medium	Poor	Total	
	- - - - - - M Acres - - - - - -			
High	58.2	9.7	67.9	47
Low	50.2	6.2	56.4	39
Decadent	20.3	-	20.3	14
Total	128.7	15.9	144.6	100

Because of the light volumes per acre, some of the mature sawtimber stands are marginal from a logging standpoint. About 24 M acres (16 percent) of the mature stands have less than 5 M board feet of sawtimber per acre (Table 12).

TABLE 12 - AREA OF MATURE TIMBER BY RISK AND VOLUME CLASSES OF MERCHANTABLE SAWTIMBER

Volume Groups	Risk Classes			TOTAL	Percent
	High	Low	Decadent		
MBF/Acre	- - - - - M Acres - - - - -				
Less than 2.5	-	-	17.9	17.9	12
2.5 to 4.9	-	3.6	2.4	6.0	4
5.0 to 9.9	16.9	13.6	-	30.5	21
10.0 to 14.9	20.0	6.0	-	26.0	18
15.0 +	31.0	33.2	-	64.2	45
TOTAL	67.9	56.4	20.3	144.6	100

Rehabilitating and reforesting cutover areas in mature stands are further complicated by a large volume of nonmerchantable or nonusable wood that must be destroyed before the land can be brought back into production. This nonusable wood frequently consists of:

a. Mature, sound, live trees 5" to 9" in d.b.h.

b. Mature material of all sizes that does not meet the one-third or one-half merchantability requirements of timber sale contracts.

Table 13 illustrates the area of mature timber by volume classes of nonusable wood. The volumes shown, generally, are additional to merchantable quantities, although not always, since the stands that are decadent have little or no merchantable volume. All of this nuisance material will have to be disposed of one way or another at great cost in time and money if our forests are to be made fully productive. The area of chief concern is that containing over 2,000 cubic feet per acre, which is about one-third of the mature acreage.

TABLE 13 - AREA OF MATURE STANDS HAVING NONUSABLE WOOD BY VOLUME CLASSES

Volume Classes	Area	Percent of Total
Cubic Feet	M Acres	
Less than 500	46.3	32
501 to 1,000	34.7	24
1,001 to 2,000	18.8	13
2,001 to 3,000	11.5	8
3,001 to 4,000	5.8	4
4,001 +	27.5	19
TOTAL	144.6	100

About 20.3 M acres on this working circle have been classed as decadent. These stands contain less than 5 M board feet of usable sawtimber per acre, and over half of the cubic volume is nonusable material. In addition to the decadent stands, there are 25.8 M acres of low volume stands that are marginal from a logging standpoint (Table 14). The plan indicates a need to rehabilitate all decadent stands during the next 20 years.

TABLE 14 - AREA OF MATURE STANDS BY BROAD ECONOMIC OPERABILITY CLASSES

Class of Stands	Area	Percent of Total
	M Acres	
Decadent	20.3	14
Partially Operable	25.8	18
Operable	98.5	68
TOTAL	144.6	100

2. Two-Story Mature Timber Stands

There are approximately 75 M acres of two-storied stands in the working circle (Table 15). Of this, only about 43 M acres contain volumes exceeding 2.5 M board feet per acre and therefore considered operable. On 24.4 M acres the overwood overtops manageable seedling, sapling, or pole stands. The balance is associated with other sawtimber and ordinarily would be logged in connection with intermediate or harvest cuttings.

Under section V, Regulation, this plan provides for removing the overwood from 24.4 M acres within the next 20 years. This amounts to 1,200 acres annually.

All two-storied stands will be harvested by conventional overwood removal methods. The understory will be considered as part of other immature acreage and treated accordingly.

Past experience indicates that harvesting the overwood from 61-80 year understory requires detailed sale planning and administration. Actual marking of all trees to cut is necessary rather than merely designating trees to be removed. Logging damage to the crop trees in the understory may be severe unless careful logging methods are employed. Intense sale supervision and administration must occur on sales of this type.

TABLE 15 - AREA OF TWO-STORIED STANDS
BY OVERWOOD VOLUME CLASSES

Overwood Classes	Area	Percent of Total
MBF	M Acres	
Less than 2.5	32.2	43
2.5 to 5.0	23.1	30
5.0 to 10.0	20.0	27
10.0 + 1/	-	-
TOTAL	75.3	100

1/ Overwood volumes exceeding 10 MBF are considered single-story.

3. Immature Stands

As shown in Table 10, stands less than rotation age occupy about 75 percent of the commercial forest land.

The annual sawtimber cutting drain on this working circle is approximately 151 board feet per acre from land available for timber production (680.7 M acres). In contrast, the average annual growth rate for those acres not occupied by mature stands (536.1 M acres) is only 118 board feet per acre.

In order to correct the above condition, this plan provides for:

a. Programing more of our allowable cut from stands containing overwood, thus making the understory more productive.

b. Prompt regeneration of all cutover land.

c. Thinning young seedling and sapling stands subject to heavy and medium competition within the next 10 years and as much of the vigorous, young pole growth as possible.

d. Regeneration of good and medium nonstocked site within the next 10-year period.

e. Rehabilitation of decadent old growth stands on good and medium site within the next 20 years.

Growth rates of immature stands during the past 10-year period have been slow. This is due to excess competition and heavy mortality from blister rust, pole blight, root rots, snow breakage, windthrow, and

insects, arranged about in their order of importance. Many immature stands needed thinning soon after establishment. Many still do. Stocking in the bulk of these stands greatly exceeds the desirable number per acre. Full 60 percent is seriously overstocked (Table 16).

TABLE 16 - AREA OF YOUNG STANDS UNDER 60 YEARS OF AGE BY STOCKING CLASS

Stocking Class	Area	Percent of Total
Trees/Acre	M Acres	
Less than 1,000	134.2	39
1,000 to 2,000	99.8	29
2,000 to 3,000	44.8	13
3,000 +	65.4	19
TOTAL	344.2	100

The effects of overstocking are quite evident, too, when size of crop trees by age is compared to planted stands (Fig. 5).

Detailed stand analysis indicates that about two-thirds of the immature stands need some form of cultural treatment (Table 17).

TABLE 17 - AREA OF IMMATURE STANDS BY TREATMENT NEED

Area	Area in M Acres	Percent of Total
Needing treatment	341.0	67
Not needing treatment	168.0	33
TOTAL	509.0	100

GROWTH COMPARISONS OF
PLANTATIONS AND WILD STANDS

Coeur d'Alene W. C.

1963

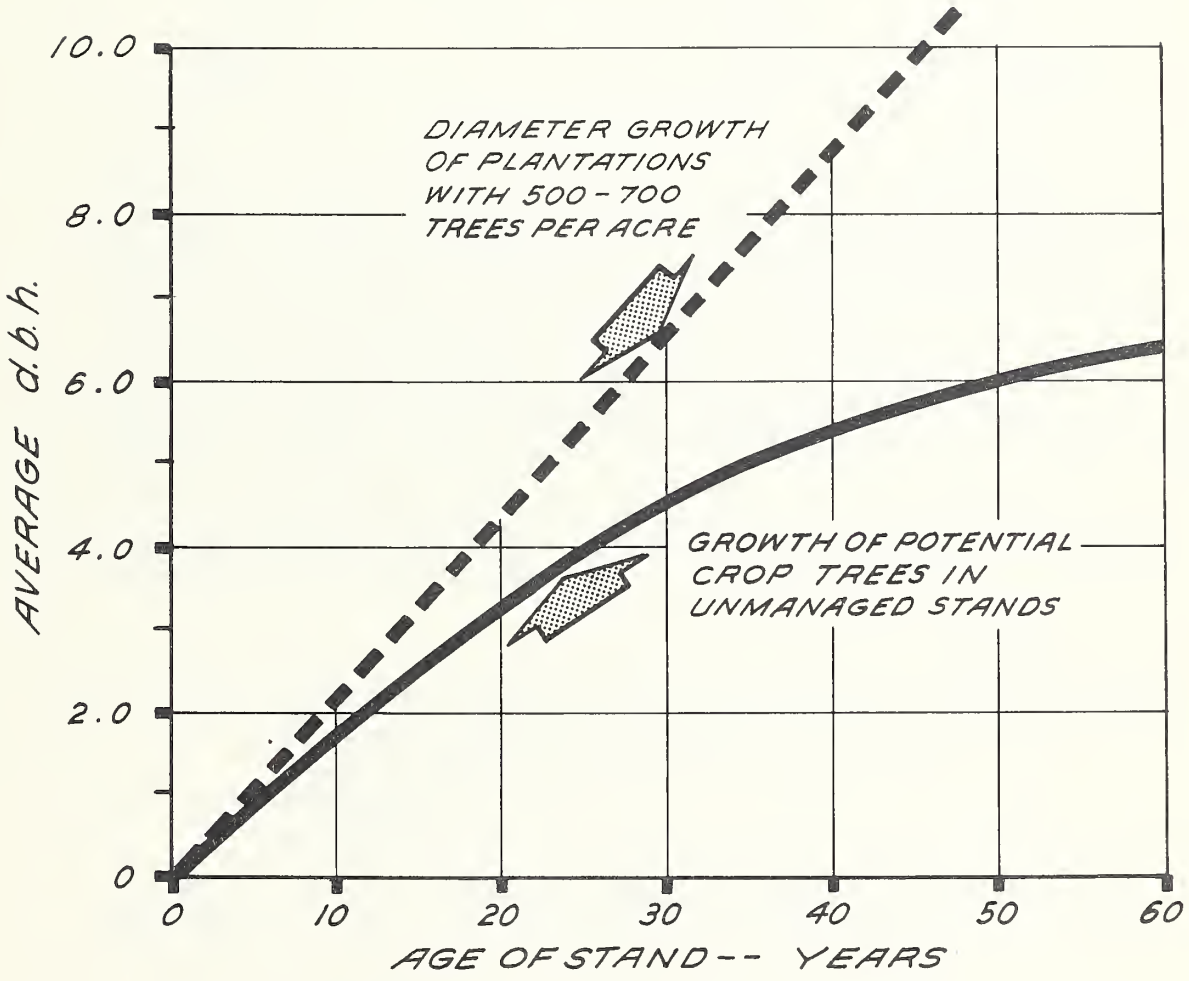

fig. 5

About 85 percent of all stands needing attention will require precommercial treatment (Table 18).

TABLE 18 - AREA OF IMMATURE STANDS BY CLASS OF TREATMENT

Class of Treatment	Area in M Acres	Percent of Total
Commercial Thinning	49.7	15
Precommercial Thinning		
Vigorous Stands	82.7	24
Low-Vigor Stands	208.6	61
Total	291.3	85
TOTAL	341.0	100

Stands needing treatment vary widely in capacity to respond to treatment. The 82.7 M acres listed for precommercial treatment are vigorous and should respond well. Most of these are young stands under 40 years of age. Other low-vigor stands classed as treatable pose a special problem. For the most part, these are stands that came in after the 1910 burn. While many of these stands probably would still respond to treatment, they have grown in an overstocked condition for some time now and have lost much of their vigor. Response no doubt would be slow. In addition, they would require the highest treatment costs.

A separate analysis of samples taken on cutover areas indicates the following recommended treatments:

	Percent
Thin, Prune, etc.	46
Regeneration Cut and/or Overwood Removal	22
Rehabilitation	9
Planting	8
No Treatment	15

This indicates a need for accelerated management programs following cutting.

4. Nonstocked Areas

There is a total of 27.1 M acres of nonstocked land of good and medium sites available for management. About 25.0 M acres of this

should be scheduled for planting during the plan period. Three-fifths of this acreage will need site preparation. This is exclusive of 13.3 M acres of low-site brushfields on which management will be deferred but ultimately will need treatment.

5. Summary of Management Needs

TABLE 19 - SUMMARY OF ANNUAL TREATMENTS FOR EACH CLASS OF GROWING STOCK AND NONSTOCKED CONDITION

Treatment	Mature Stands			Immature Stands			Non-stocked Areas	TOTAL	%
	High Risk	Low Risk	Decadent	Sawtimber	S&S	Other			
	Acres								
Regeneration Cuts	5,000	-	-	-	-	-	-	5,000	30
Overwood Removal	-	-	-	-	-	1,200	-	1,200	7
Risk Cuts	-	1,000	-	-	-	-	-	1,000	6
Rehabilitation	-	-	1,000	-	-	-	-	1,000	6
Commercial Thinning	-	-	-	1,000	-	-	-	1,000	6
Precomm. Thinning	-	-	-	-	1,550 1/	-	-	1,550	9
Planting	2,450	-	1,000	-	-	-	2,500	5,950	36
TOTAL	7,450	1,000	2,000	1,000	1,550	1,200	2,500	16,700	100

1/ The initial program in seedling and sapling stands suffering moderate to heavy competition.

The above summary of annual management needs is reflected cost-wise in the following analysis (Table 20). This analysis is based on average 1963 cost figures in the working circle.

TABLE 20 - COST ESTIMATES FOR ANNUAL TREATMENTS

		Estimated Cost (M Dollars)
Regeneration Cuts - 5,000 acres (in single-story stands)		
Clearcut	4,000 acres	
Shelterwood and Seed Tree	1,000 "	
Total	5,000 acres	
Cost of Reforestation:		
Slashing	4,000 acres @ $30.00 per acre	$120
Burning	4,000 acres @ $ 5.00 per acre	20
Planting (Stock and labor)	2,450 acres @ $75.00 per acre	160
Overwood Removal		
Thinning costs shown under Thinning		-
Sanitation and Salvage - No reforestation needs		-
Rehabilitation - 1,000 acres (Cuts in decadent stands where values are low and no K-V money can be collected.)		
Slashing (with salvage rights to contractor)	1,000 acres @ $35.00 per acre	35
Burning	1,000 acres @ $10.00 per acre	10
Planting	1,000 acres @ $65.00 per acre	65
Commercial Thinning - No outlay		-
Precommercial Thinning - 1,550 acres		
Thinning	1,550 acres @ $40.00 per acre	62
Pruning	1,550 acres @ $15.00 per acre	23
Planting Nonstocked Areas - 2,500 acres (3/5 need site preparation)		
Site preparation	1,550 acres @ $30.00 per acre	45
Planting	2,500 acres @ $65.00 per acre	162
Compartment Examination		
Cost - 16,700 acres annually	@ $ 0.25 per acre	4
	Total Cost	$706

V. REGULATION

All growing stock in the working circle will be under even-aged management except possibly certain working groups in use areas. This requires choice of appropriate rotational ages and cutting periods.

A. ROTATIONS AND CUTTING PERIODS

Average rotations and approximate diameters at those rotations are shown in Table 21. Rotations selected for the various types include average regenerative periods of about five years.

TABLE 21 - AVERAGE ROTATIONS AND SIZES BY TYPES

Type	Rotation	Average DBH of Crop Trees
White Pine	120	19
Ponderosa Pine	120	20
Western Larch	130	20
Douglas-fir	130	20
Spruce	120	18
Grand Fir	120	20
Hemlock-Cedar	120	18
Lodgepole Pine	100	15

The above rotations represent culmination of mean annual growth, International Rule, for trees 7" d.b.h. and over in sawtimber types (FSH 2413.2). For lodgepole pine, growth in cubic feet for trees 5" d.b.h. and over was used.

Rotations selected are early enough in the lives of the principal species to minimize losses from insects and disease. They are not sufficiently long to produce much high quality material unless stands are managed intensively throughout the rotation.

The rotations apply to average conditions. Individual stands growing on sites below average will require more time to mature, and less time when sites are above average. Many existing stands exceed rotation age, or will before they are cut.

A long-term objective will be to establish cutting periods which will maintain satisfactory growth throughout the rotation period. The immediate objective will be to schedule treatments to overstocked, immature stands every 20 to 30 years.[1/] Rotations, cutting periods, and treatments will be determined for each stand by compartment examination procedures.

1/ USDA Tech.Bulletin #830, August 1942.

B. GROWTH AND MORTALITY

Growth and mortality expressions are found in Table 22. These are shown for various classes of growing stock (also in Appendix Tables 9, 10, and 11).

TABLE 22 - PAST AND POTENTIAL GROWTH

Growth and Mortality	Per Acre	Total
	BF	MMBF
Net Periodic Annual Growth (1953-1962 incl.):		
Mature Stands	78	33.0
All Growing Stock	113	70.4
Mortality (1958-1962 incl.):		
Mature Stands	61	25.5
All Growing Stock	44	27.3
Past Mean Annual Growth on Present Stands	124	51.9
Sustained Yield Capacity 1/	392	254.0

1/ Based on studies by Intermountain Forest and Range Experiment Station. Sustained yield capacity based on normal yield tables shown in Appendix Table 11.

Net periodic growth for trees 9" d.b.h. and over has been low during the past 10 years due to very limited amounts of growing stock between 80 and 120 years of age and relatively high mortality. It should be substantially higher in the near future when large acreages of 21-40 and 41-60 age classes, and more trees in the 61-80 age class reach sawtimber size. Progress also should be made in holding down losses in the white pine type where most of the mortality has occurred.

Mean annual growth rates are used in allowable annual cut calculations (Appendix Table 17B). These rates were determined from present stands by dividing average volumes per acre by stand age.

The sustained yield capacity and its more practicable attainment, 70% SYC, are shown as goals to be sought by the end of the rotation.

C. CUTTING LIMITATIONS AND OBJECTIVES

Regulation of the growing stock will be by area with volume coordination. Area regulation is most logical for even-aged management and will result in more prompt development of desired stand structure (FSH 2413.21).

In calculating a trial allowable cut, preference was given to regulatory methods showing results in both area and volume. The Kemp formula does this and was used in getting preliminary estimates of cut (Appendix Table 17A). Final decisions on levels of cut were based on results secured from a tabular method, which tests certain trial cuts against the ability of the growing stock to sustain them (Appendix Table 17B). The tabular method showed that the National Forest growing stock is unable to support the levels of cut indicated by the Kemp formula, due to a critical shortage of area and volume in the 81 to 120 age classes. It also indicated the possibility of increasing the allowable annual cut after about 60 years when large acreages of young growth are expected to mature. Future reinventories and redeterminations of the allowable cut will decide the wisdom of doing so. Such reinventories and redeterminations of cut are planned at 10-year intervals, but may be scheduled at shorter intervals if catastrophic losses occur or other conditions warrant.

Regulation of cut will apply to several classes of growing stock (1) mature, single-story stands, (2) two-story stands with commercial quantities of mature overwood, and (3) immature stands containing commercial products. Products from the first two are shown under Harvest cuts, those from the last are under Intermediate cuts (Table 23).

1. Harvest Cuts

   a. Live Sawtimber

   Live sawtimber will be the main product from harvest cuts. However, a minor amount of dead sawtimber and a considerable amount of other products will result from clear-cutting methods (Table 23). It is anticipated that sawtimber utilization will be down to a 9" d.b.h. minimum. If utilization is not consistently down to 9" d.b.h., less sawtimber will be realized and more of other products.

   The tabulation method indicates that an average of 5,000 acres of mature, single-story stands should be cut and regulated annually. From it an average annual yield of about 93 million board feet of sawtimber may be expected during the plan period. This rate of cutting will establish a rotation for all growing stock of 127 years, which is considered satisfactory.

   It is possible to get a great deal more than 93 million board feet from 5,000 acres of clear-cut area by consistently choosing high volume stands for cutting, or conversely, to cut over insufficient area in striving for an exact volume of allowable cut. Considerable care must be taken to reach a fair balance of each. It is better to come close to both area and volume objectives than to hit one precisely and miss the other widely.

The 5,000 acres designated for harvest cutting area is slightly below the amount that would be cut over under strict area control (5,550 acres). Other factors being equal, this would permit a slight buildup of growing stock.

Overwood volumes on another 1,200 acres will be removed as part of the total allowable annual cut. This should yield a minimum of 7 million board feet of sawtimber from stands exceeding 2.5 M board feet per acre. Overwood volumes in stands running less than 2.5 M board feet are now inoperable and probably will have to await maturity of the young understory to be harvested, or be harvested in connection with intermediate cuttings. For purposes of determining the allowable annual cut, it is presumed that all overwood stands of sufficient volumes will be harvested within a period of 20 years.

The two categories of mature sawtimber cuttings should yield a total of 100 million board feet annually from 6,200 acres. As stated previously, this allowable cut is contingent upon utilization of sawtimber to 9" d.b.h. Should utilization be only to 11" d.b.h., the average annual yield would be about 95 million board feet.

b. Salvable Dead Sawtimber

Associated with, and in addition to, the allowable cut of live sawtimber will be a small quantity of salvable dead sawtimber available for removal. This is believed to average near 150 board feet per acre on areas to be harvest cut. If so, the total cut on 6,200 acres would be near 1 million board feet.

The principal opportunity to expand the cut above 100 million board feet of sawtimber in the near future lies in capturing impending mortality and utilizing dead trees. Sawtimber trees are presently dying at the rate of 25 million board feet per year. About 5 percent of this is available to the existing road system. With a more intensive road network it should be possible to salvage a substantially larger portion of the trees that die each year.

c. Other Products

The area of mature single-story timber scheduled for harvest cut annually will yield about 1.1 MMCF of products between 5" and 9" d.b.h. Not all of this material has been utilized in the past due to undeveloped markets. However, as markets and utilization opportunities improve every effort will be made to utilize it. Removal of this material will be regarded as a continuing objective and unregulated.

2. Intermediate Cuts

a. Immature Sawtimber Stands

The above harvest cuts do not consider volumes that may be harvested as thinnings in immature sawtimber stands. Most well stocked, immature sawtimber stands will yield commercial quantities of sawtimber and other products at intervals of 20 to 30 years without materially reducing yields at rotation age. Cutting budgets will include harvesting such material in accordance with silvicultural needs. Most of the yield will represent captured mortality. 1/

Appendix Table 18 shows there are approximately 30,000 acres of growing stock which should be scheduled for commercial thinning. Based on a 30-year cutting period, about 1,000 acres will be available for cutting annually. When cut, this area should yield nearly 2 million board feet of small sawtimber, plus other products. Control of cutting will be by area.

It would be possible, with an expanded road system, to increase intermediate cuttings somewhat above the level shown in Table 23. However, opportunities will be limited until large acreages of young growth in the 21-40 and 41-60 age classes reach commercial size.

b. Immature Poletimber Stands

There is no demand for small pole material now, and since these conditions probably will prevail throughout the plan period, cuttings of this character will be considered a continuing objective and will be unregulated pending improvement of market conditions. Management objectives concerning these stands are stated under section IV, Management Situation C-3.

3. Special Cutting Areas

The foregoing cutting limitations and objectives consider that rather uniform clear-cutting practices will be applied. In some areas, where other uses predominate, modified cutting may be used (FSH 2413.15). It is not anticipated that significant reductions in yield will result from this variation in cutting practice to warrant special allowable cut calculations. Annual yields from these areas, therefore, are included in the annual cutting limitations (Table 23). It is estimated that these areas will annually yield about 7.0 MMBF from regeneration cuts and 1.0 MMBF from overwood removal. Such stands will be scheduled for annual treatment as needed.

1/ Intermountain Forest & Range Experiment Station Research Note #19, May 1955.

4. Summary of Cut

a. Working Circle

TABLE 23 - ANNUAL CUTTING LIMITATIONS AND OBJECTIVES 1/

Type of Cut	Area	Sawtimber			Other Products
		Live	Dead	Total	
	Acres	MMBF (Scribner)			MMCF
Harvest					
Regeneration	5,000	93.0	1.0	94.0	1.1
Overwood Removal	1,200	7.0	-	7.0	-
Intermediate	1,000	2.0	-	2.0	0.1

1/ The total allowable annual cut is the yield from 7,200 acres, estimated to be 102 MMBF of live and 1 MMBF of dead sawtimber. Other products are unregulated. For further details see Appendix Table 19.

b. By Blocks or Districts

The Forest Supervisor will establish annual cutting limitations and objectives by blocks. These cuts will be in terms of both area and volume for primary forest types or type groupings. They will consider risk of mature timber, economic considerations, and need. As a guide, Table 24 apportions the annual allowable cut of live sawtimber on the basis of area and volume of mature sawtimber in each block and major type grouping.

As a minimum, control will be exercised over the pine types and by total for all types. Some variation in accomplishment may be expected from year to year, but control of accumulated undercuts or overcuts will be in accord with FSH 2412.12, R-1 Supplement No. 93.

TABLE 24 - ANNUAL CUTTING LIMITATIONS FOR HARVEST CUTTINGS BY BLOCKS 1/

Block or District	Area by Type			Volume by Type		
	W-P	Other	Total	W-P	Other	Total
	- - -	Acres	- - -	- - -	MMBF	- - -
Fernan	300	950	1,250	8.2	16.8	25.0
Kingston	200	630	830	6.6	13.4	20.0
Magee	330	1,050	1,380	6.8	13.7	20.5
Wallace	370	1,170	1,540	9.1	18.4	27.5
TOTAL	1,200	3,800	5,000	30.7	62.3	93.0

1/ For further details see Appendix Table 19.

VI. MANAGEMENT PROGRAMS

Four facts stand out in the Coeur d'Alene Working Circle.

1. The growing stock situation has deteriorated rather than improved during the past few decades. In particular, the structure of the commercial forest is below that desired from a sustained yield standpoint.

2. White pine has become less important and other species more important than was true 50 years ago, or even 20 years ago.

3. Mortality has been high in the white pine type in recent years due to blister rust and pole blight. The growth characteristics of the Forest, and the protection and silvicultural problems associated with it, will require an aggressive management program if higher yields are to be achieved.

4. Accessibility has improved to the point that a large portion of the Forest area can be brought under intensive forest management.

The plan of action to deal with these facts and increase the productivity of the working circle is based on the following key decisions:

First - Depending on the results of recently developed antibiotics for blister rust control, emphasis will be to reverse the decline of white pine and feature it in the management program if the antibiotic control program develops as expected. This seems highly desirable because white pine is still the most valuable species in this area and produces the highest yields.

Second - The timber will be grown to more productive rotation ages and be treated more promptly and precisely, according to need, as determined by stand examination procedures.

Third - Planting, thinning, and other silvicultural and protection efforts will be stepped up as quickly as possible to fill in the growing stock gaps and thus permit sustaining the present levels of cut and ultimately increasing it. They will be directed toward raising the allowable cut from the present level of 103 million annually to 200 million board feet or over by the end of the rotation.

Fourth - Silvicultural, protection, and other management efforts will be fully coordinated to achieve the desired results.

A. TIMBER MANAGEMENT

1. Cutting Budgets

Careful selection of cutting areas in each growing class is the key to successful operation of the plan. This in turn will depend upon adequate compartment examinations and records to reflect stand management needs.

The 5-Year Timber Harvest and Access Road Plans will be based on results obtained from compartment examinations. All cutting priorities will be established therefrom. In the forseeable future, 5-year plan areas and volumes will come largely from stands which prove to be highest in risk or decadent, or contain sufficient volume of overwood to be handled economically.

a. Harvest Cuts

A harvest cut of 93 million board feet annually from single-story mature stands will require carefully planned utilization. It means not only cutting high risk stands first but, if possible, taking no more than 37 million board feet out of stands with 15,000 board feet or more per acre (Table 25). The remainder should come from lower volume stands or it will not be possible to get sufficient area cut over to maintain or improve the stand structure. The foregoing rates will permit harvesting all of the high risk volume within 20 years, together with a reasonable quantity of other material.

TABLE 25 - ALLOWABLE HARVEST CUT BY CUTTING SOURCE

Stand Volume Class	Sawtimber Cut	Percent of Total
MBF	MMBF	
15 +	37	40
10-15	45	48
Less than 10	11	12
TOTAL	93	100

Insofar as possible, it is desirable to utilize all the species available, taking the bulk of the cut out of types other than white pine. Over two-thirds of the cut should be from types other than white and ponderosa pine (Table 26 and Appendix Table 19).

White pine itself should be held to less than one-third of the total harvest cut. Most of this should come from areas outside blister rust control units in the near future. The final determination, however, will rest upon the results of intensive on-the-ground examinations.

TABLE 26 - ALLOWABLE SAWTIMBER HARVEST CUTS BY TYPE

Type	Million Board Feet	Percent of Total
White & ponderosa pine	30.7	33
Larch--Douglas-fir	39.0	42
Other	23.3	25
TOTAL	93.0	100

Other situations and problems related to harvest cutting in high risk, single-story stands which will have to be met are:

(1) Rapid Change in Risk Status

Low risk white pine stands become high risk in relatively short periods of time after the effects of blister rust wave years become apparent. Mass infection quickly reduces stand vigor and makes the trees susceptible to secondary insect attacks. This points up the need for keeping records of the condition of all such stands current, and providing enough flexibility in the 5-year plan to harvest stands that become high risk within a short period of time.

(2) Premature Risk Development and Site-Risk Relationships

South slopes, which are generally below average in site quality, represent high loss areas for growing stock. Stands on these sites suffer increasing losses to fungi and insects as they approach maturity. It is particularly severe on species that might be considered "off site." The continual loss of trees actually takes a heavy toll, but often goes unnoticed. Early harvesting of merchantable timber, even though before rotation age, must be provided for in the sales program when necessary. The salvage program must also consider insect and root rot patches of timber characteristic of south slopes.

(3) Sales Sizes

Sale size classes in the working circle have pretty well stabilized at 5-6 MMBF which seems to satisfy the established

milling industry in the working circle. As we progress through the plan period, no doubt the number of smaller sales will be increased to meet plan objectives. These smaller sales will result from cleanup of odd corners and stringers, removal of seed trees and overwood, and removal of decadent stands for pulp when market conditions warrant. Many areas of overwood running less than 2.5 MBF per acre will be harvested through small Ranger sales as market conditions permit.

b. Intermediate Cuts

Intermediate cuts will be made in overstocked immature sawtimber stands; i.e., stands where crop trees are suffering competition.

The main deterrents, however, to a large active program of intermediate cuttings on this working circle are:

(1) Lack of 81-120 age class.

(2) High logging costs.

(3) Limited mill capacity which can economically utilize this size material.

(4) Inability to promote and offer for sale enough of this volume to encourage existing industry to integrate their milling facilities to better utilize this raw material.

Experience with intermediate cuttings so far indicates that even at reduced stumpage prices the volumes per acre removed will amortize spur roads of sufficient standard to remove the timber but they will not build main roads.

2. Timber Stand Improvement

a. Commercial (See Intermediate Cuts - Cutting Budget)

b. Precommercial

(1) Thinning

During the next 10 years the objective will be to achieve stand betterment in all vigorous young stands needing treatment (Table 27). Of the 343,000 acres needing treatment, 82,700 acres are vigorous stands and would respond well to treatment. Table 27 depicts a program which would be needed to accomplish this. It is larger than that shown in Table 19 since it includes the poletimber acreage. Treatment of pole stands is lower in priority than seedlings and saplings because of costs, hence was not included in that initial program.

Before a detailed thinning program can be worked out, it will be necessary to locate all the young stands to be thinned. This should be accomplished in the first two years of the plan. During these two years while the program is getting underway, a reduced area will be treated. However, by the fourth year an enlarged program can and should be undertaken.

At the end of 10 years, the precommercial thinning program should be shifted to gain control of stocking in the stands regenerated in the preceding 10-year period. Any likelihood of reaching and treating the 208 M acres of retarded young growth shown in Table 18 appears to be out of the question under present, or any conceivable, levels of financing in the future.

TABLE 27 - SCHEDULE ILLUSTRATING 10-YEAR ANNUAL THINNING NEEDS

Year	Surveys		Thinning	
	M Acres	Cost	M Acres	Cost
		M Dollars		M Dollars
1964	30.0	$15.0	1.5	$ 45.0
1965	52.7	26.4	1.5	45.0
1966	-	-	9.7	291.0
1967	-	-	10.0	300.0
1968	-	-	10.0	300.0
1969	-	-	10.0	300.0
1970	-	-	10.0	300.0
1971	-	-	10.0	300.0
1972	-	-	10.0	300.0
1973	-	-	10.0	300.0
TOTAL	82.7	$41.4	82.7	$2,481.0

(2) Pruning

There are about 21,000 acres of vigorous young white pine and ponderosa pine stands that would benefit from pruning (Table 28). Most of these are white pine plantations. These will be identified in the course of stand examination.

TABLE 28 - AREA OF YOUNG STANDS THAT WOULD BENEFIT FROM PRUNING

Type	Area	Percent of Total
	M Acres	
White Pine	21.0	49
Western Larch 1/	13.5	31
Other	8.8	20
TOTAL	43.3	100

1/ Regional policy at present is to prune only desirable white pine and ponderosa pine trees 4 to 8 inches d.b.h. on medium and better sites if there are 40 or more prunable trees per acre. It would be desirable to also prune spruce and larch if funds can be made available.

TABLE 29 - SCHEDULE INDICATING 10-YEAR ANNUAL PRUNING NEEDS

Year	Area	Cost
	M Acres	M Dollars
1964	0.5	$ 10.0
1965	1.0	20.0
1966	1.5	30.0
1967	2.0	40.0
1968	2.0	40.0
1969	3.0	60.0
1970	3.0	60.0
1971	3.0	60.0
1972	3.0	60.0
1973	2.0	40.0
TOTAL	21.0	$420.0

3. Reforestation

Both planting and direct seeding will be used to reforest cutover and nonstocked areas. The success of reforestation programs during this plan period depends entirely on our ability to keep site preparation in step with harvesting operations, nursery production of planting stock, and money to accomplish each phase of reforestation on both cutover and nonstocked lands.

The following is an estimate of planting needs for the next 10-year period (Table 30). Any successful direct seeding attempts will, of course, reduce these amounts.

TABLE 30 - SCHEDULE SHOWING 10-YEAR ANNUAL PLANTING NEEDS

Year	Planting Backlog		Current Needs		Planting Program	
	Thousand Acres	Million Trees	Thousand Acres	Million Trees	Thousand Acres	Million Trees
1964	27.1	21.7	3	2.4	1.0	0.6
1965	29.1	23.3	3	2.4	1.5	1.0
1966	30.6	24.5	3	2.4	2.1	1.6
1967	31.5	25.2	3	2.4	3.2	2.5
1968	31.3	25.0	4	3.2	6.7	5.3
1969	28.6	22.9	4	3.2	10.0	8.0
1970	22.6	18.1	4	3.2	10.0	8.0
1971	16.6	13.3	4	3.2	10.0	8.0
1972	10.6	8.5	4	3.2	10.0	8.0
1973	4.6	3.7	4	3.2	10.0	8.0

B. FOREST DEVELOPMENT

The present transportation plan[1/] shows that 895 miles of main access roads are needed to effectively manage the working circle. To date there are 660 miles existing. The following tabulation shows miles of road by classes:

Road Class	Existing	Nonexisting	Total
		Miles	
Land Access	660	235	895
Land Use	1,600	800	2,400
Truckways	50	200	250
TOTAL	2,310	1,235	3,545

The transportation plan is again being revised and the data are not available to date. This new revision may change the above classes of mileage slightly.

Many of the existing main access roads need restoration because of past heavy hauling use.

1/ Based on June 30, 1962 revised transportation plan.

Existing and proposed timber sales will amortize land use and truckway roads and, in some instances, do improvement work on land access roads. Future nonexisting land access roads will have to be constructed from appropriated funds. Timber sales will only construct those roads that are necessary in removal of the timber.

Many areas that were selectively cut in the past have adequate spur roads in existence, and these same roads are usable today. No doubt the fine road network on this working circle can be attributed to the "jammer" system of logging. The 3-Year Road and Bridge Plan is closely correlated with the 5-Year Timber Harvest Plan.

C. PROTECTION PROGRAMS

1. Insects

Insects are a serious threat in this working circle. While they seldom completely destroy a forest or eliminate a tree species, they do take a heavy toll of mature timber and need constant attention.

Douglas-fir bark beetles appear at the present time to be the most serious insect threat in the working circle. There are 32,000 acres of old-growth Douglas-fir ripe for attacks. Root rots are maintaining a steady mortality in the species, and the dead trees are serving as a breeding ground for the insects to attack other trees. In addition, the Columbus Day storm (1962), which caused so much havoc in West Coast forests, also blew over many trees on the Coeur d'Alene Working Circle. Much of the windthrown timber was Douglas-fir and it is very probable that insects, already present in endemic proportions, will breed up into large populations in this down timber. This threat will be met by increasing vigilance for signs of a population buildup over the next few years and pattern the salvage sale program to match.

Mountain pine beetles have been present in the area for a long time and have taken a considerable toll of white pine. However, with a cutting program aimed at logging high risk stands, it has been possible to keep the pine beetle population on this working circle under reasonable control.

Larch casebearer is a relatively new insect on the working circle. The casebearer population first began to develop in the larch around St. Maries, Idaho. However, in recent years it has spread north through the Coeur d'Alene and has recently been found in Montana and Washington.

Two years ago a parasite was introduced that feeds on the larch casebearer, but as yet the parasite population has not reached the point where it can be transplanted throughout the area where the insect is active.

Not much is known about the casebearer on western larch. However, on eastern larch repeated defoliation by the casebearer has not killed the trees, but it has retarded the growth.

2. Diseases

White pine blister rust is the most important destructive agent in the working circle. It became established soon after 1920, and became a serious problem about a decade later. When it did "take off," it quickly reduced the limited acreage of the white pine reproduction. In addition, it caused serious losses in older stands.

Over the years there has been a continuing effort to curtail the disease. In spite of the uphill battle, there still remain 439,000 acres of growing stock supporting at least 20 white pine trees per acre. This includes 230,000 acres of young stands (1 to 80 years) that probably can be maintained under a protection program.

Blister rust is still the major disease problem of white pine and it continues to restrict the growing program. However, the recently developed antibiotics offer new promise. Within the last few years, including 1963, 63,000 acres of white pine have been treated with antibiotics. While the use of antibiotics is still in the development stage and the degree of effectiveness not fully determined, the program of treatment is continuing. If the treatment produces satisfactory results, 181,000 more acres of white pine could be brought under protection outside of protection units unless damage makes too much headway prior to treatment.

The use of antibiotics for blister rust control remains uncertain, particularly for trees in the very young ages. However, as of now, only treated white pine planting stock will be used. Ribes eradication on planting sites will be continued until more complete results of studies of the effect of antibiotic treatment of planting stock are available.

It is expected that the initial treatment of all immature stands (159,000 acres) will be completed within the next six years. At present there are no plans to treat mature stands on this working circle. Salvage priorities will be given to heavily infected mature and nearly mature stands.

Pole blight, which seriously reduced the white pine poletimber and young sawtimber stands by 56,000 acres, is not now the problem that it was a few years ago. The disease, or affliction, became established in scattered patches, varying in size from less than an acre to over 100 acres. In recent years there has been only limited increase in the size of the areas infected with the disease, and very few new areas have been discovered. Mortality within the areas infected by the disease is still occurring but at a slow rate.

The disease is yet to be understood. Research results indicate it is closely tied to drought conditions and soil moisture-holding capacity. It is generally assumed that the dangers of the disease can be minimized by concentrating white pine production on the better sites, but this, too, remains to be proven. The practice of salvaging trees from all heavily damaged areas will be continued.

Root rots are also a serious disease problem on this working circle. While there are a number of root pathogens present in the working circle, Poria (Poria weirii) and Armillaria (Armillaria mellea) are the most important. Of the two, Poria probably is the more serious as a killer of trees. Armillaria will also kill, but its action is less dramatic.

Poria and Armillaria are found throughout the working circle and attack all tree species that occur on the area. However, hemlock, grand fir, and Douglas-fir appear to be the most susceptible. White pine, apparently, is the least susceptible to Poria. However, it does not appear to have great natural immunity to Armillaria.

These fungi apparently do the most damage on south slopes. At present the most serious damage is occurring in Douglas-fir and grand fir on these drier sites. Both Poria and Armillaria spread through the ground from live or dead material to adjacent live trees.

No preventive or control measures exist. Salvage of the dead and dying trees is made difficult by the constant and scattered nature of the losses. However, a program to salvage scattered groups of dead and dying trees will be developed and maintained to cope with the situation.

Lecanosticta has recently been discovered on young white pine. This is a needle disease about which knowledge is quite limited. It differs from the needle casts in that it is more persistent. While it does not have lethal effect, it does impair growth. No control is planned.

3. Rodents

Currently, damage by porcupines is not very serious in the working circle. It can and does become so periodically, but usually the situation is recognized quickly and control measures are applied without much damage having been suffered.

4. Other

Control of other destructive agents and forces will be achieved wherever possible through judicious cutting. As far as possible, the stands subject to the most serious losses will be cut first. While

5-year cutting plans are maintained for the working circle, each year these will be revised and cutting priorities reconsidered.

5. Fire Control

Fire plans are prepared for all active timber sales. These plans are designed to protect the sale areas and their vicinities during logging operations and will be referred to as needed.

6. Slash Disposal

Because of steep terrain and inability to use machinery to dispose of slash, or to prepare sites for reforestation, prescribed burning is the main method of slash disposal and site preparation.

Failure to get slash burned on schedule has led to difficult problems, including loss of expensive site preparation work. After the first year, the needles and fine fuels drop to the ground, brush begins to establish, and burning becomes extremely difficult, if not impossible. It then either becomes necessary to spray the brush to kill it before it will burn, or to accept whatever reproduction comes in naturally.

Once a burning opportunity has been missed, there is no alternative but to spend the money necessary to destroy the slash and brush if the land is to be brought back into production. Of the 900 acres set up for burning, and not burned during the last 5 years, over half will require further treatment.

In the future, failure to keep site preparation activities on schedule will interfere with nursery production. Nursery production is based on site preparation plans. So far this has not caused serious problems because of the limited amount of planting stock available. However, when nursery production reaches the level needed to sustain production on the working circle, it will become a serious matter if slash disposal and site preparation work are not kept on schedule. Therefore, every effort must be made to keep all operations needed to reestablish reproduction on schedule.

VII. COORDINATION WITH OTHER USES

A. Coordination of timber production with other uses will be in accordance with the FSH 2121.4 R1, Multiple Use Management Guide for Northern Region, district multiple use plans, and instructions set forth in FSM 2310.2 and 2413.15. These instructions have been considered in developing this plan.

B. MULTIPLE USE PROBLEMS

1. Soil Erosion

Although the soils on the Coeur d'Alene Working Circle are not considered erosive when compared to adjacent working circles with glaciated soils, they still need certain types of protection when disturbed by land use activities such as logging, road building, burning, etc. (See description of soils on page 11.)

2. Special Treatment Areas

Timber management practices will be modified, as necessary, on all special treatment areas. (See Tables 4 and 5 for details.)

VIII. CONTROL RECORDS

Basic control records will be prepared as required in FSH 2413.4. Additional controls will be needed as follows:

1. Develop a basic resource map record in which each stand and/or area will be identified by number.

2. Develop an ADP card record for each stand now under management from which future management can be programed.

3. Develop an ADP card record for wild stands to be brought under management as funds become available and from which priorities can be established.

Criteria for bringing wild stands under management will soon be prepared by the Regional Office. However, the following are tentative criteria for scheduling activities on areas under management:

Slash Disposal and Site Preparation - To be accomplished within one year following completion of logging activity on each sale unit.

Planting - To be accomplished in the fall following site preparation or in the following spring, if the area is not suited to fall planting.

Inspections of Planting Success - To be made:

One year after planting.
Three years after planting.

Restocking Surveys of Natural Regeneration - To be made:

Three years after cutting.
Five years after cutting.
Ten years after cutting.
Fifteen years after cutting.

Removal of Seed Trees or Shelterwood - Will be scheduled within two years following the first survey showing 80 percent or more of the area stocked.

Precommercial Thinning - To achieve basic stocking control, thinning will be done 10 years following the date of stand establishment except during this planning period when older stands will be treated. The scheduling of the treatment of these older stands will be based on a separate analysis of wild stands following the criteria to be outlined by the Regional Office.

Pruning - Will be done 25 years following the date of stand establishment on stands managed from date of establishment. Will be done in conjunction with precommercial thinning in many wild stands being brought under management.

Inspection for Commercial Thinning - Will be made not later than 40 years following date of stand establishment on good sites. On medium sites, the first inspection will not be made until the stand is 50 years old, and on poor sites, 60 years old.

Inspection for a Second Commercial Thinning - Will be made 25 years following the first commercial thinning, but not within 20 years of rotation age.

Blister Rust - Antibiotic treatment will be scheduled. Lists of work to be accomplished each year will be prepared from the cards by activity block, compartment, stand, and/or area number.

IX. IMPLEMENTING THE PLAN

When this plan is approved, it is assumed that every effort will be made to meet plan objectives within the financing available. A controlling step in managing the timber resources, as presented in this plan, is site preparation on both cutover and nonstocked areas.

Site preparation on 5,500 acres of cutover and nonstocked land annually can only be attained by aggressively implementing burning plans. Burning plans will be developed that emphasize getting the total annual job done. Also, other methods of site preparation on steep slopes that do not depend on weather conditions must be developed since white pine management will be practiced mainly on north slopes. Burning must be done when these slopes are in condition for hot, complete burning. The condition of south slopes should not control, except to burn those slopes.

The emphasis will be to meet management objectives and take necessary calculated risks to meet them in accordance with regional guidelines and directives. If this is not done, the objectives in the plan will not be met.

Records - A phase of plan implementation will be to prepare and maintain a system of resource control records which will catalog and identify (1) certain stand inventory data, (2) designate programs for examination and treatments for each stand, and (3) permit study of all the various timber growing activities in such a way as to lend continuity to the management program and reporting procedure. It is believed that a record system of this kind will promote and, to a great degree, force coordination between functions engaged in multiple use management. Such a system is being tried out experimentally at the present time on the Coeur d'Alene Working Circle.

X. APPENDIX

APPENDIX INDEX

FOREST TYPE SYMBOLS

Douglas-fir	D	Mountain Hemlock	MH
Ponderosa Pine	P	Western Hemlock	WH
Western White Pine	W	Western Redcedar	C
Lodgepole Pine	LP	Western Larch	L
Grand Fir	G	Grand Fir-Spruce	G-S
Subalpine Fir	AF	Hemlock-Cedar	H-C
Spruce	S	Other Hardwoods	OH

INVENTORY TECHNIQUE

Data for the inventory of this plan are based on instructions issued by Region One in 1961 and 1962, and on Field Instructions for Forest Inventory prepared by the Intermountain Forest and Range Experiment Station. In brief, the technique involved was:

1. Aerial photointerpretation of the various strata (condition class and forest types on photos taken in 1956 and 1959).

2. On-the-ground checking of these classifications.

3. Transfer of strata classification to a two-inch-to-a-mile planimetric map.

4. Area calculation by strata.

5. Sampling each important strata (5,000 acres or more) to established standards. Sampling work done during field season of 1962.

6. Testing the statistical accuracy of the data.

The survey was made during the summer of 1962. Samples were taken on a 4-mile grid to provide for Forest survey needs. Additional random samples were taken of major mature sawtimber strata of 5,000 acres or more, immature sawtimber, poletimber, and seedling and sapling stands by stocking and nonstocked areas.

Mature sawtimber	76 locations
Immature sawtimber	70 locations
Poletimber	46 locations
Seedling and Sapling	7 locations
Nonstocked areas	16 locations
Total	215 locations

The locations sampled for inventory and management needs were based upon a 1/250-acre fixed plot and a variable plot on each of 10 points per location according to instructions issued by the Forest Survey and Regional Office.

RELIABILITY OF THE DATA

There are two sources of error in determining the volume and acreage of the various cover types and strata.

1. Technique errors. Errors made in measuring, recording, and compiling sample plots, acreage and volume data. These errors

were minimized by training and checking of individuals responsible for field and office work.

2. Sampling errors. These are measurements of the reliability of estimates based on the variability of samples. Sampling intensity produced an overall cubic volume sampling error of +6 percent two times out of three. Sampling errors by mature type varied from ±12 to ±33 percent, and ±9 percent for immature sawtimber and poles. The following table shows the breakdown by type and stand size for mature and immature sawtimber and pole stands:

SAMPLING ERROR PERCENT

1 Standard Deviation

(Based on partial net cubic foot volume for mature and immature sawtimber and pole stands.)

Stand and Type	Sampling Error Percent
Mature Sawtimber:	
Douglas-fir	12
Ponderosa pine	23
White pine	14
Grand fir	33
Hemlock	21
Larch	20
Total Mature	10
Immature Sawtimber and Poles	
Sawtimber	8
Poletimber	13
Total Immature	9
TOTAL	6

TOTAL LAND AREA BY OWNERSHIP

Appendix Table 1 — Coeur d'Alene Working Circle

Blocks	Total Land Area	National Forest			State	Forest Industry	Other Private
		Total	Nonreserved	Reserved			
	Acres						
Fernan	194,426	165,289	164,959	330[1/]	3,735	5,030	20,372
Kingston	150,832	114,893	114,893	-	13,498	6,264	16,177
Magee	209,751	206,342	206,342	-	1,280	707	1,422
Wallace	254,442	231,209	231,209	-	-	4,288	18,945
TOTAL	809,451	717,733[2/]	717.403	330[1/]	18,513	16,289	56,916

1/ Deception Creek Natural Area.

2/ Shown as 723,408 in "National Forest Areas - 1962."

TOTAL LAND AREA BY MAJOR LAND CLASSES

Appendix Table 2 — Coeur d'Alene Working Circle

Owner	Total	Non-forest Land	Forest Land				
			Total	Non-Commercial	Commercial		
					Total	Stocked	Nonstocked
	Acres						
WORKING CIRCLE TOTAL							
National Forest:							
Nonreserved	717,403	6,420	710,983	16,627	694,356	653,972	40,384
Reserved 1/	330	-	330	-	330	330	-
State	18,513	332	18,181	254	17,927	17,160	767
Forest Industry	16,289	244	16,045	25	16,020	13,419	2,601
Other Private	56,916	7,542	49,374	1,083	48,291	46,016	2,275
WORKING CIRCLE TOTAL	809,451	14,538	794,913	17,989	776,924	730,897	46,027
Fernan Block							
National Forest:							
Nonreserved	164,959	1,232	163,727	950	162,777	158,222	4,555
Reserved 1/	330	-	330	-	330	330	-
State	3,735	107	3,628	83	3,545	3,515	30
Forest Industry	5,030	135	4,895	-	4,895	4,855	40
Other Private	20,372	3,127	17,245	-	17,245	16,650	595
Block Total	194,426	4,601	189,825	1,033	188,792	183,572	5,220

1/ Deception Creek Natural Area.

(Continued on next page)

Appendix Table 2 (continued) Coeur d'Alene Working Circle

Owner	Total	Non-forest Land	Forest Land				
			Total	Non-Commercial	Commercial		
					Total	Stocked	Nonstocked
	Acres						
Kingston Block							
National Forest:							
Nonreserved	114,893	1,587	113,306	1,401	111,905	108,375	3,530
Reserved	-	-	-	-	-	-	-
State	13,498	170	13,328	171	13,157	12,455	702
Forest Industry	6,264	64	6,200	15	6,185	4,898	1,287
Other Private	16,177	2,272	13,905	22	13,883	13,246	637
Block Total	150,832	4,093	146,739	1,609	145,130	138,974	6,156
Magee Block							
National Forest:							
Nonreserved	206,342	1,526	204,816	2,155	202,661	186,975	15,686
Reserved	-	-	-	-	-	-	-
State	1,280	55	1,225	-	1,225	1,190	35
Forest Industry	707	-	707	-	707	702	5
Other Private	1,422	435	987	2	985	970	15
Block Total	209,751	2,016	207,735	2,157	205,578	189,837	15,741

(Continued on next page)

Appendix Table 2 (continued)

Coeur d'Alene Working Circle

Owner	Total	Non-forest Land	Forest Land				
			Total	Non-Commercial	Commercial		
					Total	Stocked	Nonstocked
	Acres						
Wallace Block							
National Forest:							
Nonreserved	231,209	2,075	229,134	12,121	217,013	200,400	16,613
Reserved	-	-	-	-	-	-	-
State	-	-	-	-	-	-	-
Forest Industry	4,288	45	4,243	10	4,233	2,964	1,269
Other Private	18,945	1,708	17,237	1,059	16,178	15,150	1,028
Block Total	254,442	3,828	250,614	13,190	237,424	218,514	18,910

AREA BY TYPE AND STAND SIZE[1/]

Appendix Table 3 — Coeur d'Alene Working Circle

Forest Type	Total	Sawtimber			Pole timber	Seedling Saplings	Non-stocked
		Mature	Immature	Total			
	Acres						
D	283,587	31,803	135,344	167,147	81,985	11,565	22,890
P	34,883	3,485	21,475	24,960	7,917	498	1,508
W	119,068	38,354	36,154	74,508	31,653	5,430	7,477
LP	50,832	150	4,595	4,745	35,616	5,762	4,709
G	37,323	10,968	23,296	34,264	1,815	869	375
AF	6,355	115	3,340	3,455	2,485	410	5
S	3,970	740	1,700	2,440	610	565	355
MH	1,290	130	790	920	20	350	-
WH	58,477	40,272	14,445	54,717	1,865	620	1,275
C	425	335	40	375	15	35	-
L	97,251	17,636	33,769	51,405	38,864	5,192	1,790
OH	895	675	220	895	-	-	-
TOTAL	694,356	144,663	275,168	419,831	202,845	31,296	40,384

1/ Nonreserved commercial National Forest land.

AREA OF IMMATURE STANDS BY TYPE AND STOCKING[1/]

Appendix Table 4

Coeur d'Alene Working Circle

Forest Type	Total	Immature Sawtimber				Poletimber				Seedling & Sapling			
		Total	Stocking			Total	Stocking			Total	Stocking		
			Well	Medium	Poor		Well	Medium	Poor		Well	Medium	Poor
	Acres												
D	228,894	135,344	9,887	56,816	68,641	81,985	32,152	24,509	25,324	11,565	2,290	3,665	5,610
P	29,890	21,475	200	5,497	15,778	7,917	300	3,822	3,795	498	83	190	225
W	73,237	36,154	8,374	20,553	7,227	31,653	24,083	6,400	1,170	5,430	2,710	1,775	945
LP	45,973	4,595	560	3,025	1,010	35,616	18,823	7,251	9,542	5,762	1,820	1,895	2,047
G	25,980	23,296	3,736	11,159	8,401	1,815	1,235	540	40	869	35	834	-
AF	6,235	3,340	185	1,915	1,240	2,485	560	1,610	315	410	-	170	240
S	2,875	1,700	20	380	1,300	610	140	75	395	565	30	390	145
MH	1,160	790	585	205	-	20	20	-	-	350	265	85	-
WH	16,930	14,445	2,300	5,940	6,205	1,865	1,475	160	230	620	155	465	-
C	90	40	-	-	40	15	15	-	-	35	-	35	-
L	77,825	33,769	4,145	13,551	16,073	38,864	30,346	7,593	925	5,192	2,000	1,785	1,407
OH	220	220	-	110	110	-	-	-	-	-	-	-	-
TOTAL	509,309	275,168	29,992	119,151	126,025	202,845	109,149	51,960	41,736	31,296	9,388	11,289	10,619

1/ Stocked commercial National Forest land.

NET SAWTIMBER VOLUME (BOARD FEET) BY SPECIES AND OWNER[1/]

SAWTIMBER AND POLETIMBER STANDS

Appendix Table 5 — Coeur d'Alene Working Circle

Owner	Area	Total Volume	Volume by Species						
			D	P	W	LP	S	L	Other
	Acres	MBF (Scribner)							
WORKING CIRCLE TOTAL									
National Forest	622,676	5,167,701	1,480,202	179,593	1,253,053	221,660	59,508	448,603	1,525,082
State	17,085	132,902	49,448	7,359	24,005	5,247	814	11,297	34,732
Forest Industry	12,814	114,912	40,242	6,295	22,708	3,108	956	9,726	31,877
Other Private	48,104	313,905	119,786	16,918	53,706	15,333	2,325	26,917	78,920
TOTAL	700,679	5,729,420	1,689,678	210,165	1,353,472	245,348	63,603	496,543	1,670,611
Fernan Block									
National Forest	154,642	1,383,398	459,157	61,300	277,854	52,461	7,813	118,580	406,233
State	3,515	30,453	12,988	2,400	4,314	1,064	7	2,498	7,182
Forest Industry	4,840	42,954	17,373	2,576	6,954	1,628	49	3,683	10,691
Other Private	16,565	122,813	50,229	7,327	19,973	5,654	490	10,436	28,704
Block Total	179,562	1,579,618	539,747	73,603	309,095	60,807	8,359	135,197	452,810

1/ Stocked commercial National Forest land.

(Continued on next page)

Owner	Area	Total Volume	Volume by Species						
			D	P	W	LP	S	L	Other
	Acres	MBF (Scribner)							
Kingston Block									
National Forest	104,824	1,033,991	290,165	33,215	255,195	36,527	7,490	82,688	328,711
State	12,380	97,896	35,057	4,804	18,564	3,620	683	8,312	26,856
Forest Industry	4,873	43,806	14,655	2,584	7,073	1,203	647	4,047	13,597
Other Private	13,054	96,557	35,566	4,837	15,679	3,877	812	8,540	27,246
Block Total	135,131	1,272,250	375,443	45,440	296,511	45,227	9,632	103,587	396,410
Magee Block									
National Forest	171,005	1,173,717	295,763	35,150	311,369	62,154	26,307	104,431	338,543
State	1,190	4,553	1,403	155	1,127	563	124	487	694
Forest Industry	702	13,949	1,577	84	6,556	79	124	937	4,592
Other Private	970	5,532	1,334	203	1,427	373	128	522	1,545
Block Total	173,867	1,197,751	300,077	35,592	320,479	63,169	26,683	106,377	345,374
Wallace Block									
National Forest	192,205	1,576,595	435,117	49,928	408,635	70,518	17,898	142,904	451,595
State	-	-	-	-	-	-	-	-	-
Forest Industry	2,399	14,203	6,637	1,051	2,125	198	136	1,059	2,997
Other Private	17,515	89,003	32,657	4,551	16,627	5,429	895	7,419	21,425
Block Total	212,119	1,679,801	474,411	55,530	427,387	76,145	18,929	151,382	476,017

NET VOLUME BY TYPES AND DIAMETER GROUPS[1/]

A. SAWTIMBER AND POLETIMBER STANDS

Appendix Table 6 — Coeur d'Alene Working Circle

Forest Type	Area	Volume by Diameter Groups										Total	
		5.0-6.9	7.0-8.9	9.0 - 10.9		11.0 - 14.9		15.0 - 18.9		19.0 plus			
	Acres	MMCF	MMCF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF
D	249,132	27.7	62.6	76.2	261.0	133.5	530.1	95.4	437.8	107.7	599.4	503.1	1,828.3
P	32,877	2.9	7.6	9.1	29.6	14.6	55.7	9.0	38.9	10.4	65.2	53.6	189.4
W	106,161	13.8	25.1	29.2	106.4	64.2	269.5	74.4	359.2	136.0	668.6	342.7	1,403.7
LP	40,361	8.1	14.3	12.1	47.0	14.6	60.4	5.8	24.8	4.8	25.1	59.7	157.3
G	36,079	3.2	7.6	9.0	30.3	23.6	98.7	22.0	104.1	33.9	167.1	99.3	400.2
AF	5,940	0.7	1.7	1.9	7.0	3.0	12.6	1.9	8.9	2.1	10.7	11.3	39.2
S	3,050	0.4	0.5	0.7	3.9	1.3	5.3	1.2	4.4	1.7	8.0	5.8	21.6
MH	940	0.1	0.1	0.2	0.9	0.7	3.2	0.7	3.3	0.7	3.1	2.5	10.5
WH	56,582	2.4	5.1	6.9	21.8	15.6	59.4	18.4	77.9	63.8	328.8	112.2	487.9
C	390	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.2	1.4	0.4	1.9
L	90,269	15.3	28.4	29.3	103.7	44.5	182.0	28.3	132.7	39.3	203.4	185.1	621.8
OH	895	0.0	0.2	0.2	0.3	0.2	0.9	0.3	1.3	0.6	3.3	1.5	5.8
TOTAL	622,676	74.6	153.2	174.8	612.0	315.9	1,278.0	257.5	1,193.5	401.2	2,084.1	1,377.2	5,167.6

1/ National Forest land.

(Continued on next page)

B. MATURE SAWTIMBER STANDS

Appendix Table 6 (continued) — Coeur d'Alene Working Circle

Forest Type	Area	Volume by Diameter Groups										Total	
		5.0-6.9	7.0-8.9	9.0 - 10.9		11.0 - 14.9		15.0 - 18.9		19.0 plus			
	Acres	MMCF	MMCF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF
D	31,803	0.7	3.7	8.4	28.0	22.7	90.9	26.3	121.6	41.0	222.4	102.8	462.9
P	3,485	0.2	0.7	0.4	1.7	1.0	4.7	0.9	3.5	3.0	15.7	6.2	25.6
W	38,354	1.4	1.8	5.3	19.1	24.5	104.4	48.9	237.4	110.9	542.5	192.8	903.4
LP	150	0.0	0.1	0.0	0.5	0.0	0.6	0.1	0.0	0.1	0.0	0.3	1.1
G	10,968	0.7	1.3	0.6	1.2	6.5	29.8	9.2	44.5	21.1	98.7	39.4	174.2
AF	115	0.0	0.1	0.0	0.3	0.0	0.2	0.0	0.2	0.2	0.6	0.3	1.3
S	740	0.1	0.0	0.1	1.8	0.3	1.4	0.5	1.7	1.1	4.1	2.1	9.0
MH	130	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.4	0.2	0.7
WH	40,272	0.6	0.8	1.5	3.3	5.1	17.5	10.8	42.7	56.4	287.8	75.2	351.3
C	335	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	1.3	0.4	1.6
L	17,636	0.8	1.2	3.4	11.4	7.8	32.6	7.9	37.7	20.3	97.8	41.4	179.5
OH	675	0.0	0.1	0.1	0.0	0.1	0.4	0.2	0.8	0.5	2.7	1.0	3.9
TOTAL	144,663	4.5	9.8	19.8	67.3	68.1	282.7	105.0	490.5	254.9	1,274.0	462.1	2,114.5

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C. IMMATURE SAWTIMBER STANDS

Appendix Table 6 (continued)

Coeur d'Alene Working Circle

Forest Type	Area	Volume by Diameter Groups										Total	
		5.0-6.9	7.0-8.9	9.0 - 10.9		11.0 - 14.9		15.0 - 18.9		19.0 plus			
	Acres	MMCF	MMCF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF
D	135,344	12.2	32.7	44.9	150.2	87.0	340.4	62.9	286.2	63.4	359.7	303.1	1,136.5
P	21,475	2.0	5.5	7.0	22.1	11.8	43.7	7.7	33.6	7.3	48.8	41.3	148.2
W	36,154	3.2	7.9	12.1	43.1	28.0	115.3	22.3	106.1	23.0	115.0	96.5	379.5
LP	4,595	0.4	1.0	1.6	7.5	3.5	13.6	2.7	9.9	2.9	16.1	12.1	47.1
G	23,296	2.0	5.5	7.7	26.6	16.4	66.1	12.6	58.7	12.7	67.8	56.9	219.2
AF	3,340	0.3	0.8	1.1	3.9	2.3	9.3	1.8	8.0	1.8	9.6	8.1	30.8
S	1,700	0.2	0.4	0.5	1.7	0.9	3.4	0.6	2.5	0.6	3.8	3.2	11.4
MH	790	0.1	0.1	0.2	0.9	0.7	3.0	0.6	3.1	0.6	2.7	2.3	9.7
WH	14,445	1.3	3.4	4.7	16.1	9.8	39.0	7.4	34.2	7.3	40.4	33.9	129.7
C	40	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.2
L	33,769	3.0	8.0	11.1	37.3	22.2	87.6	16.4	75.4	16.4	91.7	77.1	292.0
OH	220	0.0	0.1	0.1	0.3	0.1	0.5	0.1	0.5	0.1	0.6	0.5	1.9
TOTAL	275,168	24.7	65.4	91.0	309.7	182.7	722.0	135.1	618.2	136.1	756.3	635.0	2,406.2

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D. POLETIMBER STANDS

Appendix Table 6 (continued) — Coeur d'Alene Working Circle

Forest Type	Area	Volume by Diameter Groups										Total	
		5.0-6.9	7.0-8.9	9.0 - 10.9		11.0 - 14.9		15.0 - 18.9		19.0 plus			
	Acres	MMCF	MMCF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF
D	81,985	14.8	26.2	22.9	82.8	23.8	98.8	6.2	30.0	3.3	17.3	97.2	228.9
P	7,917	0.7	1.4	1.7	5.8	1.8	7.3	0.4	1.8	0.1	0.7	6.1	15.6
W	31,653	9.2	15.4	11.8	44.2	11.7	49.8	3.2	15.7	2.1	11.1	53.4	120.8
LP	35,616	7.7	13.2	10.5	39.0	11.1	46.2	3.0	14.9	1.8	9.0	47.3	109.1
G	1,815	0.5	0.8	0.7	2.5	0.7	2.8	0.2	0.9	0.1	0.6	3.0	6.8
AF	2,485	0.4	0.8	0.8	2.8	0.7	3.1	0.1	0.7	0.1	0.5	2.9	7.1
S	610	0.1	0.1	0.1	0.4	0.1	0.5	0.1	0.2	0.0	0.1	0.5	1.2
MH	20	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
WH	1,865	0.5	0.9	0.7	2.4	0.7	2.9	0.2	1.0	0.1	0.6	3.1	6.9
C	15	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
L	38,864	11.5	19.2	14.8	55.0	14.5	61.8	4.0	19.6	2.6	13.9	66.6	150.3
OH	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	202,845	45.4	78.0	64.0	235.0	65.1	273.3	17.4	84.8	10.2	53.8	280.1	646.9

NET VOLUME (PARTIAL CUBIC FEET) PER ACRE BY STRATA 1/

A. SAWTIMBER SIZE TREES (9" DBH AND OVER)

Appendix Table 7 — Coeur d'Alene Working Circle

Type and Stocking	Acres	Cubic Feet per Acre by Species							Total
		D	P	W	LP	S	L	Other	
Mature Stands									
D Well	5,012	790	-	850	-	-	110	3,000	4,750
Medium	18,873	1,210	-	700	430	-	270	830	3,440
Poor	7,918	340	60	130	-	-	90	600	1,220
P Well	35	600	1,100	50	-	-	100	100	1,950
Medium	900	600	900	-	-	-	50	50	1,600
Poor	2,550	630	760	-	-	-	30	60	1,480
W Well	19,350	500	-	3,150	-	40	190	2,210	6,090
Medium	17,085	160	-	2,020	30	40	480	1,260	3,990
Poor	2,162	500	-	1,000	-	50	200	500	2,250
LP Medium	150	100	-	-	1,200	-	-	300	1,600
G Well	1,615	200	-	400	-	200	200	3,000	4,000
Medium	6,702	240	-	390	-	-	390	2,650	3,670
Poor	2,651	100	-	720	-	-	-	1,550	2,370
AF Well	85	-	-	-	100	200	-	2,500	2,800
Medium	30	-	-	-	50	400	-	1,000	1,450
S Medium	320	-	-	300	200	2,000	-	1,000	3,500
Poor	420	-	-	200	200	1,000	-	500	1,900
MH Well	65	-	-	-	100	200	-	1,000	1,300
Medium	65	-	-	-	100	200	-	600	900
WH Well	17,364	220	-	490	-	-	80	850	1,640
Medium	19,598	-	-	420	-	110	60	1,490	2,080
Poor	3,385	100	-	200	-	100	-	1,000	1,400
C Medium	60	-	-	200	-	100	-	1,500	1,800
Poor	275	-	-	50	-	100	-	850	1,000
L Well	1,025	-	-	400	-	-	1,500	700	2,600
Medium	9,354	270	-	230	-	-	220	1,200	1,920
Poor	7,257	240	-	670	-	230	790	670	2,600
OH Well	55	100	-	-	-	-	-	1,600	1,700
Medium	400	100	-	-	-	-	-	1,400	1,500
Poor	220	50	-	-	-	-	-	700	750
Immature Stands									
Sawtimber:									
Well	29,992	750	20	650	-	-	270	990	2,680
Medium	119,163	1,030	160	380	120	-	230	720	2,640
Poor	126,025	610	80	90	10	-	60	340	1,190
Poletimber:									
Well	109,149	280	20	300	210	-	100	90	1,000
Medium	51,960	120	-	210	30	60	60	220	700
Poor	41,736	100	110	30	-	30	-	-	270

1/ National Forest land.

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B. POLETIMBER SIZE TREES (5" to 9" DBH)

Appendix Table 7 (continued) — Coeur d'Alene Working Circle

Type and Stocking	Acres	Cubic Feet per Acre by Species							Total
		D	P	W	LP	S	L	Other	
Mature Stands									
D Well	5,012	60	-	20	-	-	-	170	250
Medium	18,873	40	-	-	-	-	-	70	110
Poor	7,918	10	-	-	10	-	-	120	140
P Well	35	100	150	40	-	-	50	50	390
Medium	900	100	100	-	-	-	50	50	300
Poor	2,550	170	20	-	-	-	40	10	240
W Well	19,350	-	-	10	-	-	-	110	120
Medium	17,085	-	-	10	-	-	-	30	40
Poor	2,162	-	-	-	-	-	-	50	50
LP Medium	150	100	-	-	300	-	50	200	650
G Well	1,615	-	-	-	-	200	-	500	700
Medium	6,702	-	-	-	-	-	-	80	80
Poor	2,651	-	-	-	-	-	-	130	130
AF Well	85	-	-	-	60	210	-	210	480
Medium	30	-	-	-	-	100	-	200	300
S Medium	320	-	-	-	-	100	-	100	200
Poor	420	-	-	-	-	100	-	100	200
MH Well	65	-	-	-	100	-	-	200	300
Medium	65	-	-	-	100	-	-	200	300
WH Well	17,364	-	-	-	-	-	-	10	10
Medium	19,598	-	-	-	-	-	-	-	-
Poor	3,385	-	-	-	50	100	-	200	350
C Medium	60	-	-	-	-	-	-	100	100
Poor	275	-	-	-	-	-	-	100	100
L Well	1,025	-	-	200	-	-	100	100	400
Medium	9,354	-	-	-	-	-	-	50	50
Poor	7,257	-	-	-	-	-	-	150	150
OH Well	55	-	-	-	-	-	-	300	300
Medium	400	-	-	-	-	-	-	200	200
Poor	220	-	-	-	-	-	-	100	100
Immature Stands									
Sawtimber:									
Well	29,992	110	-	50	-	-	-	100	260
Medium	119,163	90	-	40	30	-	40	110	310
Poor	126,025	100	-	30	10	-	-	220	360
Poletimber:									
Well	109,149	150	-	170	340	-	120	130	910
Medium	51,960	60	-	130	70	-	30	100	390
Poor	41,736	40	30	-	-	-	20	-	90

(Continued on next page)

C. SAWTIMBER AND POLE SIZE TREES

Appendix Table 7 (continued) — Coeur d'Alene Working Circle

Type and Stocking	Acres	Cubic Feet per Acre by Species							Total
		D	P	W	LP	S	L	Other	
Mature Stands									
D Well	5,012	850	-	870	-	-	110	3,170	5,000
Medium	18,873	1,250	-	700	430	-	270	900	3,550
Poor	7,918	350	60	130	10	-	90	720	1,360
P Well	35	700	1,250	90	-	-	150	150	2,340
Medium	900	700	1,000	-	-	-	100	100	1,900
Poor	2,550	800	780	-	-	-	70	70	1,720
W Well	19,350	500	-	3,160	-	40	190	2,320	6,210
Medium	17,085	160	-	2,030	30	40	480	1,290	4,030
Poor	2,162	500	-	1,000	-	50	200	550	2,300
LP Medium	150	200	-	-	1,500	-	50	500	2,250
G Well	1,615	200	-	400	-	400	200	3,500	4,700
Medium	6,702	240	-	390	-	-	390	2,730	3,750
Poor	2,651	100	-	720	-	-	-	1,680	2,500
AF Well	85	-	-	-	160	410	-	2,710	3,280
Medium	30	-	-	-	50	500	-	1,200	1,750
S Medium	320	-	-	300	200	2,100	-	1,100	3,700
Poor	420	-	-	200	200	1,100	-	600	2,100
MH Well	65	-	-	-	200	200	-	1,200	1,600
Medium	65	-	-	-	200	200	-	800	1,200
WH Well	17,364	220	-	490	-	-	80	860	1,650
Medium	19,598	-	-	420	-	110	60	1,490	2,080
Poor	3,385	100	-	200	50	200	-	1,200	1,750
C Medium	60	-	-	200	-	100	-	1,600	1,900
Poor	275	-	-	50	-	100	-	950	1,100
L Well	1,025	-	-	600	-	-	1,600	800	3,000
Medium	9,354	270	-	230	-	-	220	1,250	1,970
Poor	7,257	240	-	670	-	230	790	820	2,750
OH Well	55	100	-	-	-	-	-	1,900	2,000
Medium	400	100	-	-	-	-	-	1,600	1,700
Poor	220	50	-	-	-	-	-	800	850
Immature Stands									
Sawtimber:									
Well	29,992	860	20	700	-	-	270	1,090	2,940
Medium	119,163	1,120	160	420	150	-	270	830	2,950
Poor	126,025	710	80	120	20	-	60	560	1,550
Poletimber:									
Well	109,149	430	20	470	550	-	220	220	1,910
Medium	51,960	180	-	340	100	60	90	320	1,090
Poor	41,736	140	140	30	-	30	20	-	360

GROSS BOARD FOOT-CUBIC FOOT RATIOS

Appendix Table 8 — Coeur d'Alene Working Circle

Diameter Groups	Species										
	D	P	W	LP	G	AF	S	H	C	L	OH
Cubic Foot to Scribner											
9.0 - 10.9	3.4	2.8	3.7	3.9	3.7	3.6	3.5	3.0	3.1	3.8	3.9
11.0 - 14.9	4.0	3.3	4.5	4.6	4.5	4.1	4.6	4.2	4.0	4.4	-
15.0 - 18.9	4.9	4.7	5.3	5.2	5.4	5.2	5.0	5.1	4.6	5.0	-
19.0 +	5.6	5.6	5.6	5.5	5.8	5.6	5.7	5.8	5.0	6.0	-
Cubic Foot to International 1/4"											
9.0 - 10.9	4.6	3.4	5.0	5.0	4.9	4.6	4.5	4.0	4.3	5.1	4.8
11.0 - 14.9	5.1	4.2	5.6	5.6	5.6	5.2	5.6	5.2	5.0	5.6	-
15.0 - 18.9	5.7	5.8	6.1	5.9	6.1	5.9	5.8	5.9	5.5	6.0	-
19.0 +	6.2	6.4	6.3	6.0	6.4	6.2	6.4	6.4	5.9	6.6	-

MISCELLANEOUS CONVERTING FACTORS

1. 90 cu.ft. = 1 cord
2. Sawtimber 2 cords = 1 MBF
3. Poletimber 3 cords = 1 MBF

PERIODIC ANNUAL INCREMENT AND MORTALITY

Appendix Table 9 — Coeur d'Alene Working Circle

Type and Stocking	M Acres	Gross P.A.I. /Acre cu.ft.	Gross P.A.I. Total MCF	Gross P.A.I. Total MBF	Annual Mortality /Acre cu.ft.	Annual Mortality Total MCF	Annual Mortality Total MBF	Net P.A.I. /Acre cu.ft.	Net P.A.I. Total MCF	Net P.A.I. Total MBF
Mature Stands										
D Well	5.0	34	170	833	29	145	710	5	25	123
Medium	18.9	22	416	1,872	6	113	509	16	303	1,363
Poor	7.9	17	134	563	-	-	-	17	134	563
P Poor	2.5	31	78	374	11	28	134	20	50	240
W Well	19.3	33	637	3,058	24	463	2,222	9	174	836
Medium	17.1	19	325	1,560	9	154	739	10	171	821
G Medium	6.7	30	201	925	8	54	248	22	147	677
Poor	2.7	29	78	390	-	-	-	29	78	390
WH Well	17.4	6	104	509	7	122	597	-1	-18	-88
Medium	19.6	12	235	1,105	12	235	1,105	-	-	-
L Medium	9.4	14	132	554	-	-	-	14	132	554
Poor	7.3	30	219	1,051	9	66	317	10	153	734
Total or Average	133.8	20	2,729	12,794	10	1,380	6,581	10	1,349	6,213
Adjusted Total[1]	145.0	20	2,900	13,630	10	1,450	6,815	10	1,450	6,815[2]

1/ Sample acres adjusted to agree with mapped area.

(Continued on next page)

2/ 47 bd. ft. per acre per year. Conversions at rotation age used.

Appendix Table 9 (continued) Coeur d'Alene Working Circle

Type and Stocking	M Acres	Gross P.A.I. /Acre cu.ft.	Gross P.A.I. Total MCF	Gross P.A.I. Total MBF	Annual Mortality /Acre cu.ft.	Annual Mortality Total MCF	Annual Mortality Total MBF	Net P.A.I. /Acre cu.ft.	Net P.A.I. Total MCF	Net P.A.I. Total MBF
Immature Stands										
Sawtimber:										
Well	30.0	33	990	4,653	23	690	3,243	10	300	1,410
Medium	119.2	38	4,530	21,291	15	1,785	8,390	23	2,745	12,901
Poor	126.0	32	4,032	18,950	12	1,512	7,106	20	2,520	11,844
Total	275.2	35	9,552	44,894	14	3,987	18,739	21	5,565	26,155 1/
Poletimber:										
Well	109.1	53	5,782	27,175	2	218	1,025	51	5,564	26,150
Medium	52.0	38	1,976	9,287	3	156	733	35	1,820	8,554
Poor	41.7	14	584	2,745	-	-	-	14	584	2,745
Total	202.8	41	8,342	39,207	2	374	1,758	39	7,968	37,449 2/
Total Immature	478.0	37	17,894	84,101	9	4,361	20,497	28	13,533	63,604 3/
GRAND TOTAL	623.0	33	20,794	97,731	9	5,811	27,312	24	14,983	70,419 4/

1/ 95 bd.ft. per acre per year. Conversions at rotation age used.

2/ 185 bd.ft. per acre per year. Conversions at rotation age used.

3/ 133 bd.ft. per acre per year for immature stands.

4/ 113 bd.ft. per acre per year for mature and immature stands.

MEAN ANNUAL INCREMENT

Sawtimber in Sawtimber Stands
9.0" d.b.h. Minimum Utilization

Appendix Table 10 — Coeur d'Alene Working Circle

Forest Type	Stand Category	Area	Ave.Vol. Per Acre	Ave. Age	MAI	
					Per Acre	Total
		M Acres	MBF		BF	MBF
D	Mature	31.8	14.6	149	98	3,116
	Immature	135.3	8.4	60	140	18,942
	All	167.1	-	-	132	22,058
P	Mature	3.5	7.3	143	51	178
	Immature	21.5	6.9	58	119	2,558
	All	25.0	-	-	109	2,736
W	Mature	38.4	23.6	160	147	5,645
	Immature	36.1	10.5	63	167	6,029
	All	74.5	-	-	157	11,674
LP	Mature	0.1	7.4	80	92	18
	Immature	4.6	10.3	70	147	676
	All	4.7	-	-	148	694
G-S	Mature	11.7	15.6	183	85	995
	Immature	25.0	9.7	69	141	3,525
	All	36.7	-	-	123	4,520
H-C	Mature	40.7	8.7	163	53	2,157
	Immature	15.3	9.1	79	115	1,748
	All	56.0	-	-	70	3,905
L	Mature	17.6	10.2	165	62	1,091
	Immature	33.8	8.6	60	143	4,833
	All	51.4	-	-	115	5,924
AF & Other	Mature	0.8	6.6	163	40	32
	Immature	3.5	9.2	80	115	402
	All	4.3	-	-	101	434
ALL	Mature	144.7	14.6	160	92	13,232
	Immature	275.2	8.7	63	141	38,713
	ALL	419.8	-	-	124	51,945

NOTE: Variations due to rounding.

SUSTAINED YIELD CAPACITY BY TYPES

Appendix Table 11 — Coeur d'Alene Working Circle

Based upon 9"+ DBH Utilization for Sawtimber

Forest Type	Rotation Age	Site Class	Area	Normal MAI per Acre 1/		Realizable MAI/Acre 2/		Total Normal		Total Realizable	
				Sawt.	Pole.	Sawt.	Pole.	Sawt.	Pole.	Sawt.	Pole.
	Years		M Acres	BF	CF	BF	CF	MMBF	MMCF	MMBF	MMCF
D	130	II-III	283.4	272	43	190	30	77.1	12.2	53.8	8.5
P	120	III-IV	34.9	258	-	180	-	9.0	-	6.3	-
W	120	II-III	119.0	500	20	350	14	59.5	2.3	41.6	1.7
LP	100	III-IV	50.8	105	22	73	15	5.3	1.1	3.7	0.8
G-S	120	II-III	41.3	442	27	309	19	18.2	1.1	12.7	0.8
H-C	120	II-III	60.2	442	27	309	19	26.5	1.6	18.6	1.1
L	130	II-III	97.2	323	34	226	24	31.4	3.3	22.0	2.3
AF-OH	130	III-IV	7.2	251	41	175	29	1.8	0.3	1.3	0.2
TOTAL 3/			694.0	330	31	231	22	228.8	21.9	160.0	15.4

1/ From "Tables of Yields and Mean Annual Increment of Fully Stocked Stands in Major Forest Types of Region."
2/ 70 percent of normal.
3/ Unregulated working group (677 acres) eliminated.

AREA BY AGE GROUPS AND TYPES

Appendix Table 12

Coeur d'Alene Working Circle

Age Group	Total	Forest Types							
		D	P	W	LP	G	S	L	Other
					M Acres				
Immature Stands									
1- 20	32.6	29.7	-	2.9	-	-	-	-	-
21- 40	119.5	45.8	16.1	28.6	13.3	-	1.8	12.4	1.5
41- 60	192.2	91.6	8.7	19.0	16.2	-	1.1	45.9	9.7
61- 80	136.3	61.8	4.8	22.7	11.0	14.0	-	19.5	2.5
81-100	27.7	-	0.3	-	5.5	12.0	-	-	9.9
101-120	1.0	-	-	-	-	-	-	-	1.0
Subtotal	509.3	228.9	29.9	73.2	46.0	26.0	2.9	77.8	24.6
Mature Stands									
121-160	97.9	26.4	3.2	26.5	0.2	5.0	-	12.2	24.4
161-200	19.8	3.8	0.3	5.0	-	-	0.7	-	10.0
200+	27.0	1.6	-	6.9	-	5.9	-	5.5	7.1
Subtotal	144.7	31.8	3.5	38.4	0.2	10.9	0.7	17.7	41.5
Nonstocked	40.4	22.9	1.5	7.5	4.7	0.4	0.4	1.8	1.2
TOTAL 1/	694.4	283.6	34.9	119.1	50.9	37.3	4.0	97.3	67.3

1/ Excludes reserved lands.

AREA BY SITE AND TYPE [1/]

Appendix Table 13 — Coeur d'Alene Working Circle

Forest Type	Site		
	Good	Medium	Poor
	Percent		
D	48	42	10
P	68	30	2
W	78	22	-
LP	28	72	-
G	18	82	-
L	59	23	18
H-C	47	48	5
Forest Average All Types	52	40	8

1/ Based on 1962 inventory. Former site table used for management consideration.

PERCENT OF SAWTIMBER VOLUME BY LOG GRADES [1/]

Appendix Table 14 — Coeur d'Alene Working Circle

Species	Log Grades				Total
	1	2	3	4	
	Percent				
D	2	11	59	28	100
P	30	25	34	11	100
W	31	25	33	11	100
LP	0	9	53	38	100
H	12	16	30	42	100
C	0	10	59	31	100
L	21	24	48	7	100
Other	2	11	59	28	100
ALL SPECIES	13	17	49	21	100

1/ From 1956 inventory.

SOUND DEAD AND USABLE CULL

Appendix Table 15 — Coeur d'Alene Working Circle

Forest Type	Mature Sawtimber Stands	Sound Dead		Usable Cull	
		Per Acre	Total	Per Acre	Total
	Acres	CF	MCF	CF	MCF
D	31,803	168	5,343	100	3,180
P	3,485	-	-	16	56
W	38,354	118	4,526	176	6,750
G	10,968	140	1,536	244	2,676
H	40,272	76	3,061	558	22,472
L	17,636	68	1,199	172	3,033
Other 1/	2,145	-	-	-	-
Total	144,663	108	15,665	264	38,167

1/ No Sound Dead or Usable Cull considered.

PERCENT DEFECT BY SPECIES AND DIAMETER GROUPS

Appendix Table 16 — Coeur d'Alene Working Circle

Diameter Class	Species										
	D	P	W	LP	WLP	G	AF	S	WH	C	L
Cubic Foot - Percent Defect											
9.0 - 10.9	1	1	1	1	1	1	1	1	1	1	1
11.0 - 14.9	2	1	2	2	3	4	4	1	7	4	1
15.0 - 18.9	3	4	5	9	10	10	12	3	15	12	3
19.0+	5	7	12	12	15	15	16	6	25	20	7
Board Foot - Percent Defect											
9.0 - 10.9	1	1	1	1	2	1	2	1	3	2	1
11.0 - 14.9	3	2	4	4	5	10	10	3	15	10	2
15.0 - 18.9	6	8	10	18	20	20	25	7	30	25	7
19.0+	11	15	25	25	30	30	35	12	50	40	15

CALCULATION OF ANNUAL ALLOWABLE HARVEST CUT OF SAWTIMBER

(Minimum 9" d.b.h. Utilization)

Appendix Table 17 — Coeur d'Alene Working Circle

A. KEMP FORMULA $AAC = \left(\frac{9Am + 7Ai + 5Ap + 3As + Ar}{4R}\right) Vm$

Am = Area of mature sawtimber stands
Ai = Area of immature sawtimber stands
Ap = Area of pole stands
As = Area of S&S stands
Ar = Area restocking
AAC = Annual Allowable Cut
R = Rotation
5 = Number of stands
Vm = Average volume per acre mature sawtimber stands

SAWTIMBER

Forest Type	Rotation Years	Area Calculations (Area shown in M acres)	Area Acres	Per Acre MBF	Total MMBF
D	130	$\frac{9(31.7)+7(135.2)+5(82.0)+3(11.6)+11.0}{5(130)}$	2,596	14.6	37.9
P	120	$\frac{9(3.5)+7(21.4)+5(7.9)+3(0.5)+1.0}{5(120)}$	372	7.3	2.7
W	120	$\frac{9(38.3)+7(36.1)+5(31.6)+3(5.4)+7.0}{5(120)}$	1,298	23.6	30.6
LP	100	$\frac{9(0.1)+7(4.6)+5(35.6)+3(5.7)+2.5}{5(100)}$	461	7.3	3.4
G-S	120	$\frac{9(11.7)+7(25.0)+5(2.4)+3(1.4)+0.7}{5(120)}$	495	15.6	7.7
H-C	120	$\frac{9(40.7)+7(15.2)+5(1.9)+3(1.0)+1.2}{5(120)}$	811	8.7	7.0
L	130	$\frac{9(17.6)+7(33.8)+5(38.9)+3(5.2)+1.6}{5(130)}$	933	10.2	9.5
Other	130	$\frac{9(0.8)+7(3.6)+5(2.5)+3(0.4)+0.0}{5(130)}$	71	6.6	0.5
TOTAL			7,037		99.3

(Continued on next page)

OTHER PRODUCTS

Forest Type	Rotation	Annual Cutting Area	Cutting Objective	
			Per Acre	AAC
	Years	Acres	CF	MCF
D	130	2,596	140	363.4
P	120	372	257	95.6
W	120	1,298	81	105.1
LP	100	461	653	301.0
G-S	120	495	184	91.0
H-C	120	811	35	28.4
L	130	933	112	104.5
Other	130	71	210	14.9
TOTAL		7,037		1,103.9

B. TABULAR CHECK

9"+ d.b.h. Utilization for Sawtimber

AAC: 93.0 MMBF Forest Type: All Rotation: 127 Years

Present Age Class	Average Cutting Age	Area 1/	MAI (M) PAI (P)	Volume /Acre at Cutting Age	Total Volume to Cut	Years to Cut		Annual Area to Cut
						Each Age Class	Cumu-la-tive	
Years	Years	M Acres	BF	MBF	MMBF			M Acres
120+	R+	144.6	(P) 47	15.7	2,270	24	24	6.0
110	134	1.0	(M) 141	18.9	19	-	24	-
90	117	27.7	(M) 141	16.5	457	5	29	5.5
70	111	136.2	(M) 141	15.6	2,128	23	52	5.9
50	124	192.0	(M) 141	19.9	3,825	41	93	4.7
30	R	119.4	(M) 141	20.3	2,426	26	119	4.6
10	R	32.7	(M) 231	28.8	941	10	129	3.3
Restock	R	25.0 2/	(M) 231	28.8	720	8	137	3.1

1/ Excludes unregulated working group.

2/ Medium and better sites only.

This tabulation indicates that the annual area and volume to cut should be increased after 60 years.

CALCULATION OF INTERMEDIATE CUT

Appendix Table 18

Coeur d'Alene Working Circle

Well Stocked Strata	Annual Allowable Area to Cut		Average Volume per Acre				Annual Allowable Intermediate Cut		
	Commercial Forest	Annual Cut 1/	Total		To Cut 2/		Area to Cut Annually	Volume to Cut	
			Sawt.	Pole	Sawt.	Pole		Sawtimber	Poletimber
	Acres	Acres	MBF	CF	MBF	CF	Acres	MBF	MCF
Immature Sawtimber									
D2W	9,887	330	8.4	332	1.7	66	330	554	21.8
P2W	200	7	6.9	346	1.4	75	7	10	0.5
W2W	8,374	279	10.5	308	2.1	62	279	586	17.3
LP2W	560	19	10.3	315	2.0	63	19	39	1.2
G-S2W	3,756	125	9.7	322	1.9	64	125	242	8.0
H-C2W	2,885	96	9.1	321	1.8	64	96	175	6.1
L2W	4,145	138	8.6	328	1.7	65	138	239	9.0
AF-OH2W	185	6	9.2	326	1.8	65	6	11	0.4
TOTAL	29,992	1,000					1,000	1,856	64.3

1/ Based on a 30-year cutting period.

2/ Percentage of cut most appropriate for stands tending to be overstocked.

ANNUAL CUTTING LIMITATIONS AND OBJECTIVES[1/]

Appendix Table 19

Coeur d'Alene Working Circle

Block and Type of Cutting	Area by Types					Volume by Types					Volume Other Products
	L-D	W-P	LP	Other	Total	L-D	W-P	LP	Other	Total	
	Acres					MMBF (Scribner)					MMCF
WORKING CIRCLE TOTAL											
Harvest:											
Regeneration	2,500	1,200	320	980	5,000	39.0	30.7	2.7	20.6	93.0	1.1
Overwood											
Removal	-	-	-	-	1,200	-	-	-	-	7.0	-
Intermediate	-	-	-	-	1,000	-	-	-	-	2.0	0.1
Fernan Block											
Harvest:											
Regeneration	620	300	80	250	1,250	10.5	8.2	0.7	5.6	25.0	0.2
Overwood											
Removal	-	-	-	-	300	-	-	-	-	1.9	-
Intermediate	-	-	-	-	490	-	-	-	-	0.9	0.1
Kingston Block											
Harvest:											
Regeneration	420	200	50	160	830	8.4	6.6	0.6	4.4	20.0	0.2
Overwood											
Removal	-	-	-	-	200	-	-	-	-	1.5	-
Intermediate	-	-	-	-	130	-	-	-	-	0.3	-

1/ National Forest land

(Continued on next page)

Appendix Table 19 (continued) Coeur d'Alene Working Circle

Block and Type of Cutting	Area by Types					Volume by Types					Volume Other Products
	L-D	W-P	LP	Other	Total	L-D	W-P	LP	Other	Total	
	Acres					MMBF (Scribner)					MMCF
Magee Block											
Harvest:											
Regeneration	690	330	90	270	1,380	8.6	6.8	0.6	4.5	20.5	0.2
Overwood Removal	-	-	-	-	330	-	-	-	-	1.5	-
Intermediate	-	-	-	-	50	-	-	-	-	0.1	-
Wallace Block											
Harvest:											
Regeneration	770	370	100	300	1,540	11.5	9.1	0.8	6.1	27.5	0.2
Overwood Removal	-	-	-	-	370	-	-	-	-	2.1	-
Intermediate	-	-	-	-	330	-	-	-	-	0.7	-